

POPULAR MECHANICS *Build-it-yourself*

RANCH-TYPE HOUSE

By Tom Riley • BUILDER OF THE ORIGINAL HOUSE
AT PORTLAND, OREGON



A Luxury Home at Budget Cost

YOU CAN BUILD THIS MODERN HOME YOURSELF AND SAVE THOUSANDS OF DOLLARS. COMPLETE STEP-BY-STEP INSTRUCTIONS, DETAILS, DIAGRAMS AND PICTURES SHOW YOU HOW. EXPANDABLE DESIGN ENABLES YOU TO CONVERT CARPORT INTO THIRD BEDROOM. ADD BREEZEWAY AND GARAGE AT YOUR LEISURE. MANY MODERN FEATURES, SUCH AS ISLAND-WALL FIREPLACE, TWIN WARDROBE CLOSETS, WOOD-PANELLED WALLS, ETC. ARE INCLUDED.

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POPULAR MECHANICS

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RANCH-TYPE HOUSE

BY TOM RILEY



POPULAR MECHANICS PRESS

ILLUSTRATIONS BY—

- RALPH LINNENBURGER
- ORVILLE T. CULP
- ELDON SCHIEL

FOREWORD...

Dedicated to the man who is willing to do things with his own hands and who desires more of a house than just a shelter, this book describes step by step the construction of a modern home. Herein, the reader will learn the details and advantages of today's best construction methods. And here he will discover his answer to the problem of obtaining a real home amidst the soaring prices of this second half of the 20th century.

This "dream home" was born of the many requests of the readers of POPULAR MECHANICS MAGAZINE for the plans of a modern ranch-type house. In answer to the requests, a thorough research on how to build it and what to build it with was started by the Crafts Editors two years ago. Then architect John J. Whelan, famous for his ranch-type homes, was commissioned to draw the actual plans of the dream home that had to be a real home at modest cost and had to require no special skill to build. Then Tom Riley, a free lance writer with no experience in carpentry, was asked to test-build the house—to check each part of the construction from the amateur's viewpoint and to gather those details that can only be found by actually doing the work.

With the aid of one friend, a former salesman, Tom Riley did all the work, excepting only the fireplace and such other jobs as excavation, which naturally require some additional help. He built the house mainly of plywood, using the new methods of paneling that have been developed in recent years. To ease the labor, he purchased some power tools, the cost of which were saved in the window framing alone.

The result of this two years of research, designing and testing speaks for itself. Here is your ranch house. You will find that its construction is one of the things you can learn as you go. You will find that it requires considerable labor on your part, but the savings thus gained are tremendous. Above all, you will discover as Tom Riley did that there is no greater satisfaction than in constructing your own home with your own hands.

JAMES R. WARD, Craftsman Editor
POPULAR MECHANICS MAGAZINE

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So you want a new home!

Most of us do. And most of us have a little money in the bank today to spend on our dream home. But when we begin to obtain estimates on having the house built, the bank account looks worse than it did during the depression.

You probably already have found that you cannot afford a modern home like the above. Not with its seven rooms. Nor its double garage or that multiusable space, the enclosed breezeway. Inside, such niceties as fireplaces and automatic dishwashers must be forgotten, and—most serious!—all the rooms and closets must be squeezed down in size until the structure has little resemblance to a real home.

Even worse, you find the ready-built house that is within reach of your budget

—sliced way down in size and without a single luxury—is available only by a 20 or 30-year debt. Is there no better answer?

Yes, there is a much better answer, and it's easier than you might think. You can build the POPULAR MECHANICS Ranch-Type House yourself! By building with your own hands you can have this kind of a home, a real home, within your budget. It seems an expensive home, but it isn't. The ranch house has been carefully designed throughout for amateur construction, designed so you can save thousands of dollars and still include today's modern features. You can build it in many versions,—with or without basement, in a basic and various larger sizes, in modern or conventional design—to fit your likes and your lot. And you will find

Here is the dream home for the amateur builder. Designed by famed architect John J. Whelan, it is easily built of plywood or any other building material by modern methods for only \$7450.

Meet author-builder Tom Riley and wife, Vinita, who say: "If we could build it, you certainly can."





Functional linen closet forms "island wall" of the hallway and conceals cold-air register of furnace. Another feature is the indirect lighting.

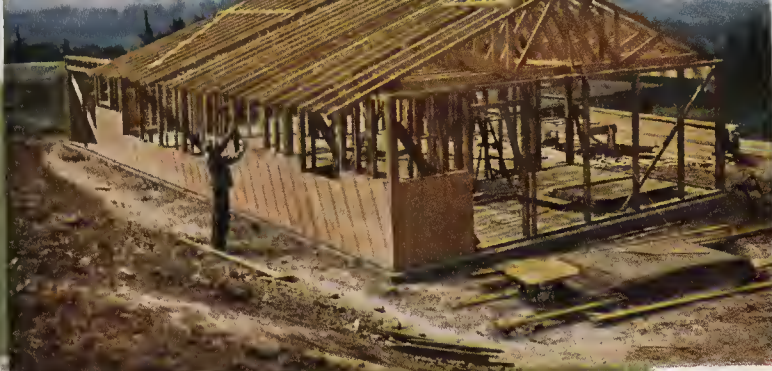
amidst these times of soaring prices and scarce skilled labor that your savings are much greater than ever before in history and that it is actually easier today to build your own home!

The savings are tremendous. In this second half of the 20th century, 50 to 65 percent of the cost of a new home is in the labor and contracting fees. You can easily save more than one-half the cost of this house—\$5,000 to \$10,000, depending on which size you build—by doing the work yourself. Or you can save a large percentage by doing only part of it. If you have the house mainly built by others, doing only the lighter finishing jobs yourself, you can still enjoy a tremendous saving in contracting fees and those



Here is the ranch house in its full 81-ft. size. You can build several other combinations of garage and breezeway, or stop at basic plan.





Prefabricated roof trusses simplify construction and require no bearing wall across the living-dining area. Top photo shows the basic house being partly sheathed with unsanded plywood.

time-consuming little jobs by using these plans and instructions.

Best of all, you don't have to be a carpenter to build the ranch house. House construction has always been one of the few things you could jump into and learn as you go—especially if the house was designed for amateur construction. The first months are spent on rough carpentry, places where cabinet-fit joints are not needed. You may bang your fingers the first day, but you will have plenty of time to learn how to use a hammer and saw before it is important in the final appearance of the house.

3

Firelight from this easily-built fireplace gives both living and dining areas a luxurious setting.





Living room is transformed into a dining room by simply raising this "boomerang" table, which you make, and sliding out nesting sofa chairs.

This is even more true today than it has been in the past. The best architects have been struggling to lower house costs by simplification. Their modern truss roofs, window framing, modular planning, and the overall "clean" lines of their designs have not only given beautiful architecture—they also give a home that the amateur can build much easier than the "gingerbread" houses of the past.

Bricked side of the kitchen is formed by the island-wall fireplace. Here is a modern furnace and food counter with maple chopping block.



Living room, showing walnut-plywood paneled wall at rear and its accordion door. Huge hassocks show one modern way of furnishing this.

Good power tools have been developed to speed and simplify the work of today's rushed carpenters. *Even more, these tools speed and simplify the work for the amateur.*

Manufacturers of building supplies have been helping too. They have striven to simplify the installation job—to reduce the total cost of their products. The resulting modern methods of wall paneling, house wiring, furnace ducting and the like—these have not been able to hold down the cost of a ready-built home but they have done one great thing. *They have simplified such jobs to where anyone can do them!*

Therefore, POPULAR MECHANICS presents the Ranch-Type House, a modern home of modern construction, a *real* home that you can build yourself. Every possible help to you has been put into its plans.

The services of the noted architect, John J. Whelan—designer of embassies in Washington, the Drew Pearson home in Virginia, the Lanai Rooms of the Broadmoor Hotel, and especially famous for his West Coast ranch houses,—were obtained for planning this home of today. John



worked constantly on the two basic requirements, that this be a real home for you at modest cost and that it be a home requiring no special skill to build. Furthermore, he designed it so that you who haven't much time to spend at the site can prefabricate a good part of the house in your present basement or garage!

Then, to prove that there was nothing

in the plans that couldn't be built by a rank amateur, the author was asked to build the test house shown herein. I was chosen because I had no previous experience of any kind in building, and so that, being another amateur, I could describe the steps of construction from your viewpoint.

Your author built every part of the



Dining area of living room shows "boomerang" table and dining benches. Note cork floor that can be used throughout the house if so desired.

ranch house as your author completed it in May, 1951. If you have looked this far, there is no need to say that this is a design for a *real* home. Best of all, it is an easy house to build.

ROOM FEATURES

There is more to the ranch house than just its ease of construction. The editors of *POPULAR MECHANICS* and architect John Whelan have gone all out to give you a home that incorporates every modern feature possible without excessive cost.

Throughout, the Ranch-Type House has been "open-planned" in the modern manner—wherever blank walls are not necessary they have been eliminated. Therefore the rooms are exciting spaces—not close, dowdy boxes—that flow into each other and to the outdoors, to give easy movement throughout the house and the luxurious feeling of spaciousness.

Look at the living room. Its floor space is not large, yet this is a large room. The L-shape of the room itself, its continuation on through a dual-purpose dining area, the generous expanses of glass, the ceiling extending on over the hallway and the fact

ranch house excepting only the fireplace. My wife and one friend, a former salesman, helped on the job. Other friends—all amateurs—helped on such things as excavating and concrete work. I found the modern construction methods a blessing to the amateur. I saved money and gained a more attractive finish inside and out by using the new applications with

plywood. I installed the plumbing, wiring, insulation and heating—as can you today—and found throughout, as *POPULAR MECHANICS* Crafts Editor James R. Ward said at the beginning: "A house is much bigger but requires less skill to build than an ordinary piece of furniture."

The views on these pages attest the final outcome of the plans. They are of the test

that the corner fireplace seems to carry that corner back to the fire itself—all these various items have been carefully put together to give you a living room with the feeling of spaciousness in which to stretch out, to play, to relax by the fire.

The living room is not what interior decorators call "a frozen cube." Its furnishings can be arranged in various ways to suit your needs now and 20 years from now. This is a room that will always share

James R. Ward, Popular Mechanics Craftsman editor, inspects test house at Portland, Ore. TV area is designed to be out of room traffic.

the sun, for it is lighted by wide windows on both sides of the house. The vestibule and guest closet that are included are a blessing on stormy days and—because the world progresses—the area to the left of the fireplace is especially planned for video. Now or later, a television receiver at the walnut wall will have side lighting, no crosslanes of traffic and it is secluded from the rest of the room so that it will not bother those uninterested in the program.

The island-wall fireplace is unique. This corner fireplace gives firelight through

both the living and dining areas. The simplest type to build, it rises like an island through the floor at the center of the house. A seven-foot brick wall rises alongside, the two rising together to the ceiling to form the only partition between the kitchen and the living area. Thus, at a minimum of cost the house has a brick wall in both the kitchen and living room. With the 2-ft. fieldstone hearth, the effect is of a huge, expensive masonry wall in

Cork tile, similar to that used on the floor, can be placed over plywood on the walls for a modern, striking effect in the ranch-house den.



the living room. Actually there is no more brick in this whole island-wall fireplace than in the usual—none of its masonry is hidden behind plaster.

The dining room has been carefully planned so that it will be a part of your

The upper cupboards, flush, smooth units of oak plywood, are finished as limed oak. Cabinets at base will accept all modern electrical appliances.

living room except when you actually need a dining room—today's informal living has made a separate dining room a wasted space most of the year.

You can furnish this dining area with standard furniture, but by building just one item yourself you will both save money and have a better room. What you build is the dining table, the "Boomerang

Table" detailed herein and designed especially for this house by John Whelan. The simplest of construction, it is a huge, low coffee table with "boomerang" legs that ingeniously raise to make it a generous dining table for six to eight people. As shown on these pages, two of the modern dining benches or four of the nesting-type dining chairs fit together along the window wall to form a sofa or davenport behind the table. Thus, your dining room is a genuine part of the living room, a lounging or reading area, yet in two minutes it becomes a dining room that will accommodate the biggest of Thanksgiving dinners.

Notice there is no ordinary hall anywhere in the Ranch-Type House. The reason? Because halls are big wasters of floor space and when they can be left out of the plans you have just that much more living space.

The only hall necessary in this floor plan is that formed in front of the bedrooms by the island closet. As the closet is only 6 ft. high, it allows the living-room ceiling to extend on across the hallway and does not "box-off" this area.

The island closet itself serves four distinct purposes. It forms the partition wall of the hallway. It gives a huge storage



Bedrooms feature floor-to-ceiling ventilation, cork floors and full 10-ft. wardrobe closets. Either of the bedrooms will take twin beds.

cabinet on the hall side for your linens and a handy cabinet on the living-room side for card games and other miscellaneous uses. It both hides and simplifies the construction of the main cold-air register for the furnace. It gives a beautiful and inexpensive indirect lighting throughout the hall and that part of the living room.

The kitchen is designed so that it will give you both efficiency in the preparation of meals and downright comfort—for most of us spend a good deal of our time in the kitchen. For dining comfortably in a compact space, it contains the same good answer that restaurants use—a booth instead of a breakfast nook. There is ample free-floor—enough space so that you do not have to constantly dodge a highchair or stool in the room. There is a separate food-preparation counter handily alongside the refrigerator, complete with the maple chopping block that is such a great improvement over the old breadboard.

The kitchen cabinets are both modern and simplified. You can build them without complication. The correct spacing, wiring and plumbing are provided for every modern appliance, including an auto-

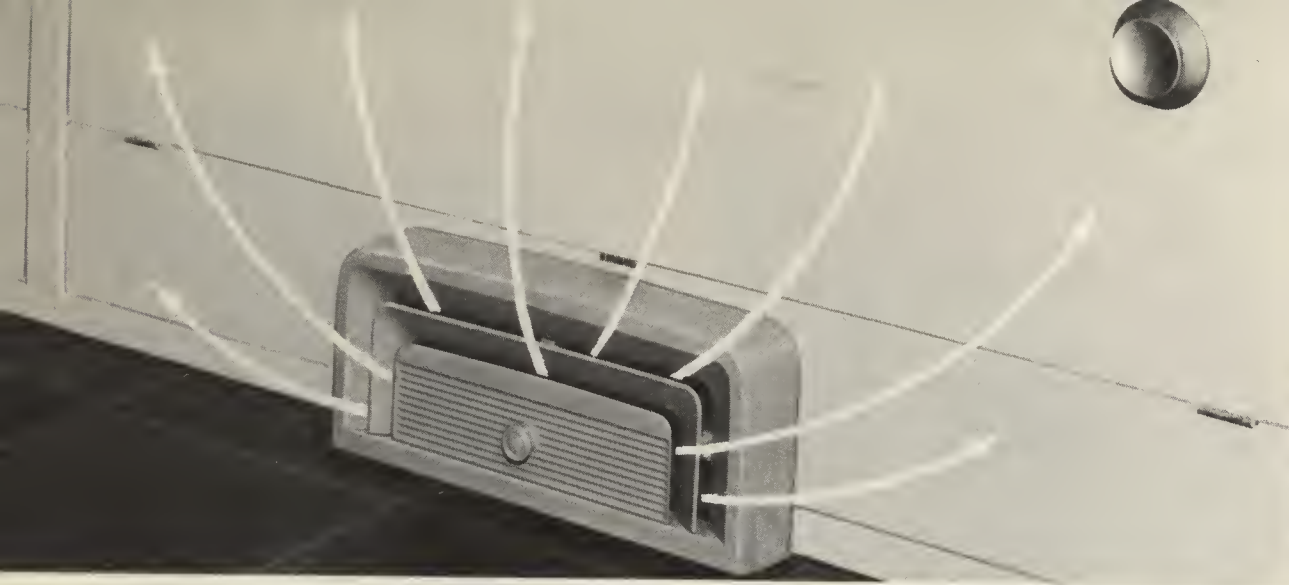
matic dishwasher and garbage disposal unit. The automatic dishwasher and its sink cabinet are included in the low cost of the house. If finances are a problem, you can further reduce the costs by substituting any standard 48-in. sink cabinet, and replace it with the electric sink at any later date without replumbing or rewiring.

This room has a grand flexibility of ar-

rangement to suit any particular desire. If you have a large family or otherwise desire the basement alternate plan, the furnace and water heater go in the basement—see the alternate plans—to give you a still larger kitchen. An alternate U-shaped plan is given for you who prefer that arrangement of your kitchen.

The utility room is designed as an at-





New-type warm-air registers "wash" the larger windows of the ranch house; warm the coldest areas and act as defrosters to cut condensation.

tractive extension of the kitchen but separated by a partition wall and door, which is usually preferable for a laundry and work area. This wall can be eliminated if you desire a large combination kitchen-laundry room. In the basement version of the house, a stairway replaces the clothes-washing equipment, which is then placed in a laundry room below.

The washing equipment occupies the window wall and it is only a step or two to the outdoors—no carrying heavy baskets of wet wash up a flight of stairs to the drying yard. Space is provided for laundry tubs, automatic washer, automatic dryer and electric ironer. A cabinet will enclose unsightly laundry tubs, and upper cabinets line the walls as in the kitchen. On the wall opposite the window, handy

space is provided for a deep freezer up to 12 or 16 cu. ft. in size.

Both the bedrooms at the right end of the house have truly adequate storage in their duplicate wardrobes—10 ft. of hanging space, plus built-in chests and blanket-storage drawers. The two wardrobes—simple to build—form the partition wall between the two rooms.

The two bedrooms are similar, except in size. Both have the finest of ventilation from floor level at the louvers to ceiling at the high clerestory windows. Both will accept either twin beds or double, and note that in both rooms the beds can be placed on the opposite wall from the door so that you do not have to walk around them to enter the rooms. Because of the built-in features of the wardrobes, only a minimum

of furniture is necessary in these rooms.

The den is a highly variable part of the ranch house, a room that can be constructed in a dozen of ways to fit your individual preferences. As shown on these pages it is a large 12 x 12 ft. den. Or here it also can be furnished as a bedroom. Or as a study-guest room with furnishings that convert into a bedroom when company arrives. As shown in the alternate plans, it can include an inexpensive half-bath—which makes it a wonderful bedroom for that teen-ager or elderly member of the family who usually desires his room separated and a little more than just a bedroom. The half-bath is also accessible from throughout the rear of the house, an extremely handy feature that gives you the benefits of two bathrooms at a very low cost.

Alongside the half-bath you can also include a darkroom—which the author did—and this makes it a den of dens for the photographer. In one version of the basic or smallest size of the house, the adaptable den is a carport until the house is expanded.

Today, the bathroom can be the most expensive room in your house. Therefore John Whalen designed the bathroom of the ranch house to use the most inexpensive fixtures that are available from plumbing dealers or the mail-order houses. But! —with the addition of a glass tub enclosure and the medicine cabinet that you build yourself, this bathroom has the advantages and glamour of those costing three times as much.

The breezeway, besides being extremely popular today, is the most inexpensive way of adding extra floor space to your home. Basically, it is just a continuation of the roof, the house and garage walls forming its two sides. It can be 8, 10 or 12-ft. wide and, for outdoor living space, it can be closed off at one end, as shown here, or left open at both ends. You can enclose the front half of its length to have a workshop, rumpus room or fourth bedroom. Best of all, it can be left as a breeze-

Top left, low-voltage wiring allows control of all lights in house from bedroom master panel. Top right, ranch house is low, ground-hugging, with wide roof overhang for weather protection. Lower left, bathroom fixtures are highlighted by self-built medicine cabinet, sliding-panel tub. Lower right, Wayne C. Leckey, assistant crafts editor of Popular Mechanics, examines bedroom windows with baffle boards, fixed screens.





Rear view of ranch house; bedrooms at far end.
John J. Whelan, architect, is in foreground.

way at present and be refitted to future needs at any later time.

You may have already noticed that the garage is built the full width of the ranch house, 25 ft. This full length costs you little more if anything than changing the roof to fit a shorter garage. It also simplifies the roof construction, giving a straight ridge line.

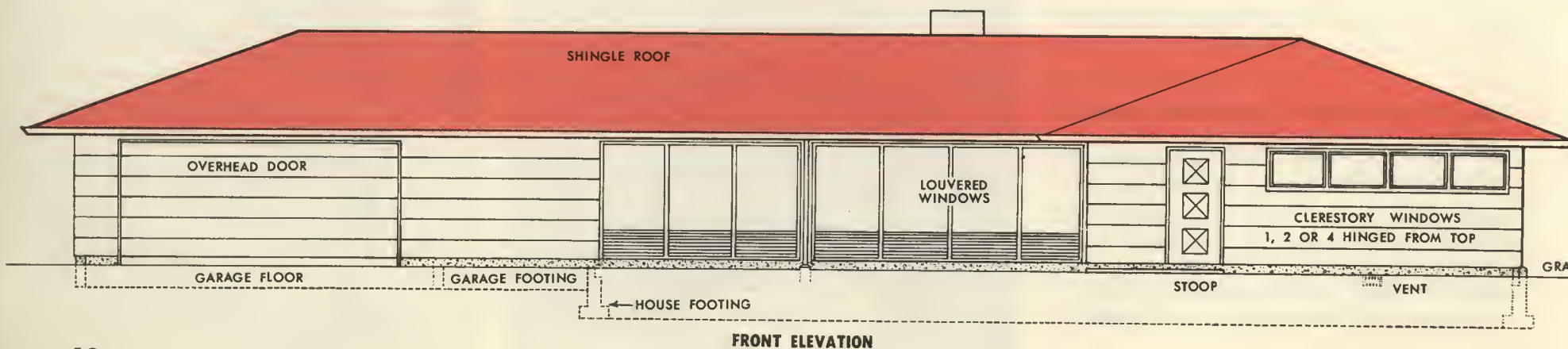
The extra length of the garage allows a workshop at the rear, and eight feet of this area is partitioned off to give a handy mud room for the lawn mower and garden supplies.

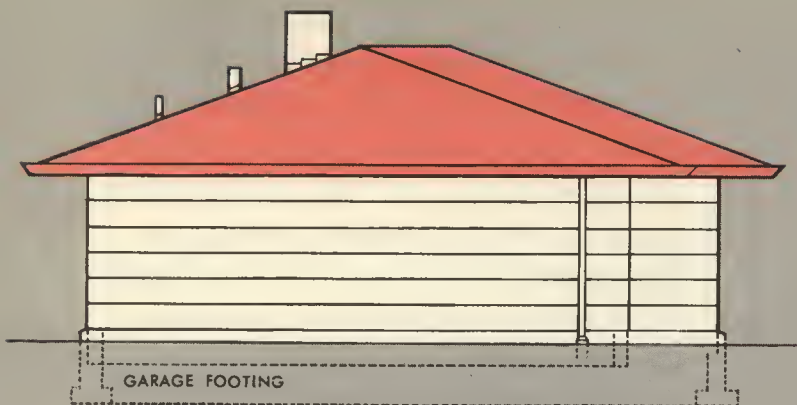
GENERAL FEATURES

When you are busily pounding and sawing away on its construction, perhaps

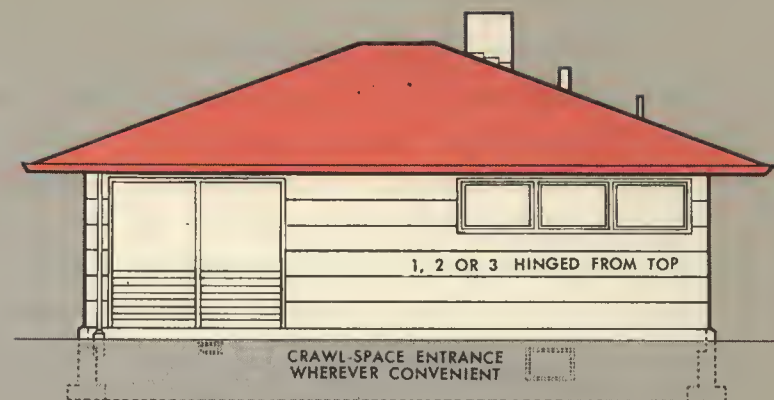
the most appreciated fact about your new home will be that it is ground-hugging. Nowhere is high scaffolding required—a tricky thing for the beginner—and you can paint this entire house with the aid of just a stepstool.

The 30-in. overhang of the roof will be appreciated later. It will shade your new home from midday sun and protect the siding from the weather. It will allow you to leave windows open during warm rains, and it has an important emergency function—it wintertime a gutter can clog with ice in such a way that water is dammed up on the roof and thus seeps through the shingles. If this happens on an overhanging roof the water will drip through the overhang without causing harm.

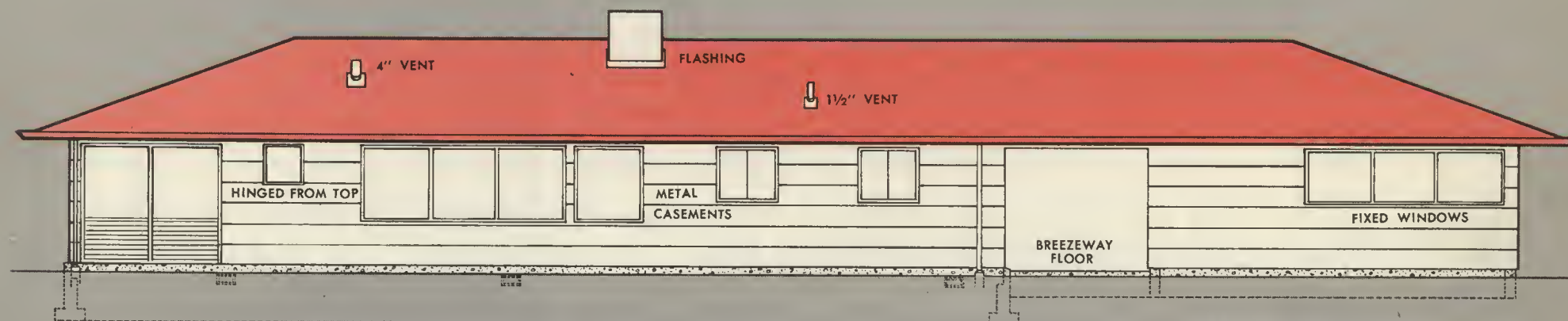




LEFT-SIDE ELEVATION



RIGHT-SIDE ELEVATION



REAR ELEVATION

The test house completed to its full 81-ft. length.

13

View with bedrooms in foreground. The ranch house is unusual in being attractive on all sides.



The window and door frames are definitely modern construction: Instead of purchasing expensive millwork, you build these yourself, the modern framing being designed especially for that purpose. A 2x6 frame is the entire window—there is no need of jamb linings, sills, trim work and the like. In the bedrooms, living room and den, the frame extends completely to the floor, giving a space for louver boxes.

The louvers below windows provide the best of ventilation; and they protect their screening, which is left permanently in place the life of the house. No obscuring the view, no juggling with screen frames each spring and fall.

A point to delight the wife is that all windows in the house are in effect box windows—the glass is on the outside edge, leaving no wide ledge on the outside of the house to collect grime and dust. Especially nice to the pocketbook is the fact that at today's prices any area of a house enclosed with this modern type of window costs less than the same area closed off with any standard solid wall. Therefore, you can have the large window expanses, yet economize!

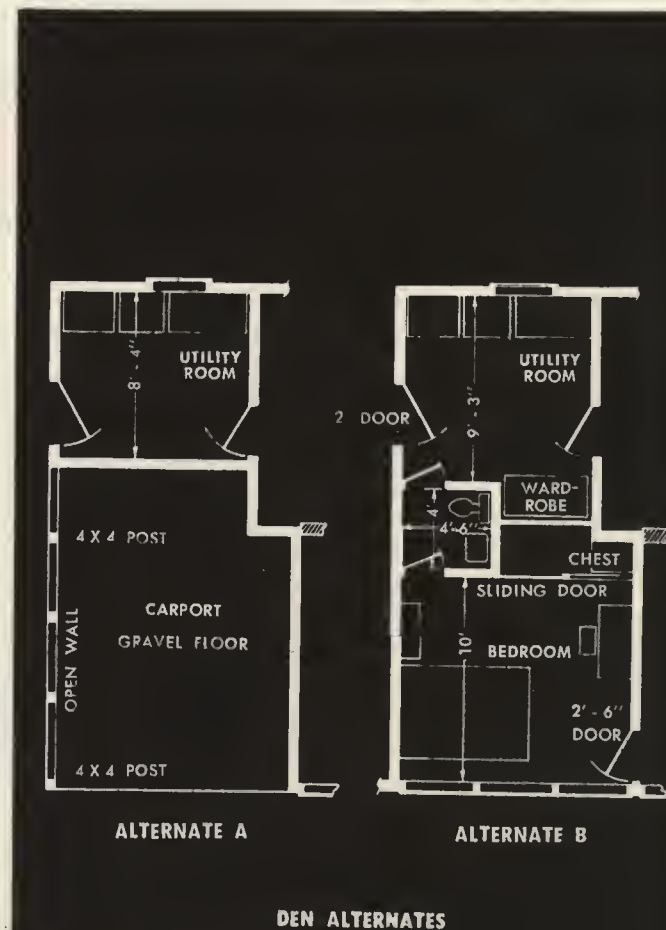
The ranch-house design takes full advantage of today's improvements in heating systems. Resembling a second refriger-

erator, the modern furnace shown on these pages goes right in the kitchen, and the duct work for its forced-air system is so simple that even your author was able to do it. Various other furnaces, in other locations, can also be used—all are explained in the section on furnace installation.

The "Air-Wall" register shown on page 10 is an improvement, too. These new registers do not just spill warm air into the rooms, but fan it out over the walls above. The registers are placed underneath the largest windows in each room. Moisture condensation on the glass in wintertime is thus reduced by the same principle as with auto windshield defrosters, and by heating the coldest radiation area of the room (the windows) these registers give you an even room temperature.

The modern low-voltage wiring system used in the ranch house is made to order for the amateur electrician. Explained fully in the section on wiring the house, this new "touch-plate" system is basically a matter of placing relay switches in a box in the attic, a relay to control each room's lights. The relays are activated by low-voltage switches, which require only "doorbell" wiring.

What this means is that you can have any number of switches controlling each room's lights without the complications and expense such as with ordinary wiring. You can have switches at every doorway, outside at front and garden doors, in the back yard—wherever convenient—and they are all nonshocking. You can install any special circuit without compli-



cations — such as a master panel in the bedroom to control all lights in the house.

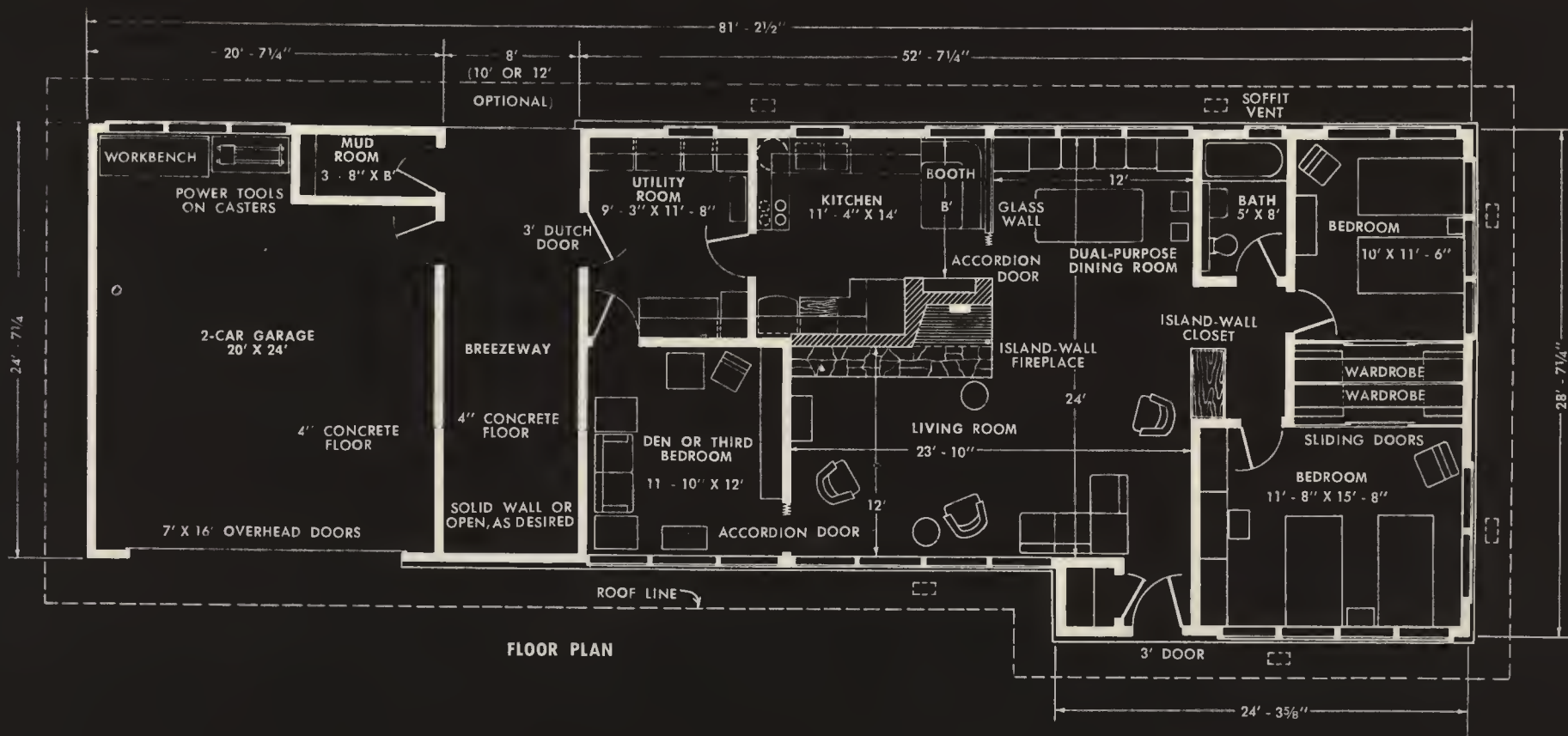
COST

The cost of the ranch house can be made to fit your pocketbook. As it was built here in the full 81-ft. size, the cost of all materials was \$7,447 in Portland, Ore., a fairly high-cost area, in the highest cost-year of the U. S. history! This figure in-

cludes the electric sink (automatic dishwasher), the table-top water heater, the furnace and all other fixed appliances. Quite interesting is the fact that the cost of the test house was not much more than the down payment required for purchasing a similar home—the realty value of the completed test house was \$20,000!

The same full-sized ranch house could be built for somewhat less without any

particular detriment to the house. It should be explained here that the test house was built to prove the plans and to be shown for inspection; consequently nothing that you would ordinarily desire today was eliminated. You can substitute an ordinary kitchen sink for the electric sink, leaving the dishwasher for some future Christmas. You can use an alternate method of laying the subfloor — as ex-



Test house as first completed in the basic size, with the carport temporarily replacing the den.

plained in the subfloor construction — which does not require an underlay of plywood for cork or asphalt tile. You can use an inexpensive soft wood instead of the more costly finish floorings and also reduce the cabinetwork and built-ins. By such alterations, you can obtain a reduction of \$500 to \$1000 in the total cost of the full ranch house.

If your main concern is to provide good shelter right now and to continue to add the refinements as time goes on, you can build the ranch house in a basic size and expand it whenever desired. As explained in the following pages, you can also build the ranch house in several other sizes and styles—to fit the size of lot you obtain and to utilize the materials that are least expensive in your locality. Thus, the total



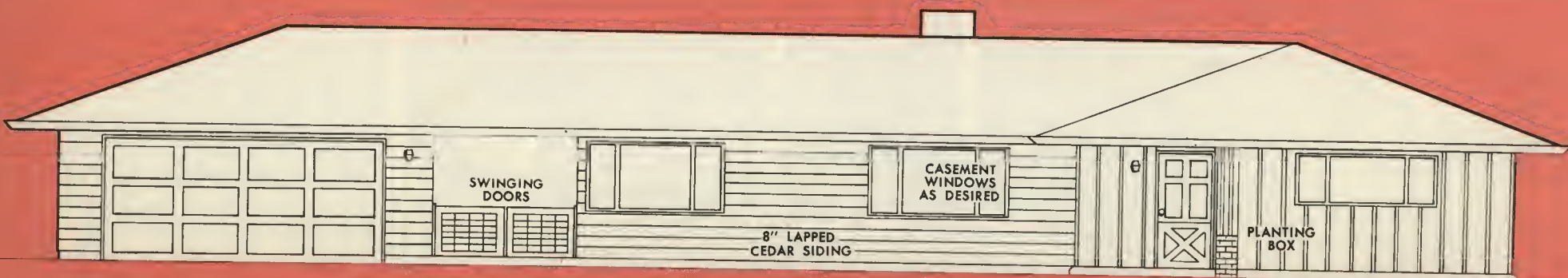
cost of all materials can be reduced to \$4800 or \$5000, the cost of the basic, or smallest, size of the house.

PLAN ADAPTABILITY

The design of the ranch house is extremely flexible—inside or out you can make many modifications and changes to fit your personal desires. The floor plan shown here and followed by the author

in the test house is one that has been carefully worked out to give an excellent room arrangement for most families. But you may desire a room or two another way, a smaller ranch house, an entirely different style of exterior. Do not hesitate to do so . . . this is to be *your* home.

You should, however, decide on all important changes before you start the construction. Several good variations in the



TRADITIONAL EXTERIOR

$\frac{3}{8}$ " OR $\frac{1}{2}$ " EXTERIOR PLYWOOD
WITH 1" BATTENS 16" O.C.

design are shown here and their construction changes are given in the alternate plans in the back of this book. Study these and fully plan out any other changes at the very beginning.

One of the simplest of all changes is to completely reverse the plan so that the bedrooms are at the left side of the house and the garage at the right. This may be desirable to encompass a view or to give the best driveway on your lot. You need only to lay out the floor plan reversed. If this working backward from the blueprints tends to be confusing, you can use an old contractors' trick which requires only an hour's time. Tape the floor plan and other detailed blueprints face on to a window with scotch tape and trace off the lines reflected to the rear side of the paper with a pencil and straightedge.

You may desire a basement. How to



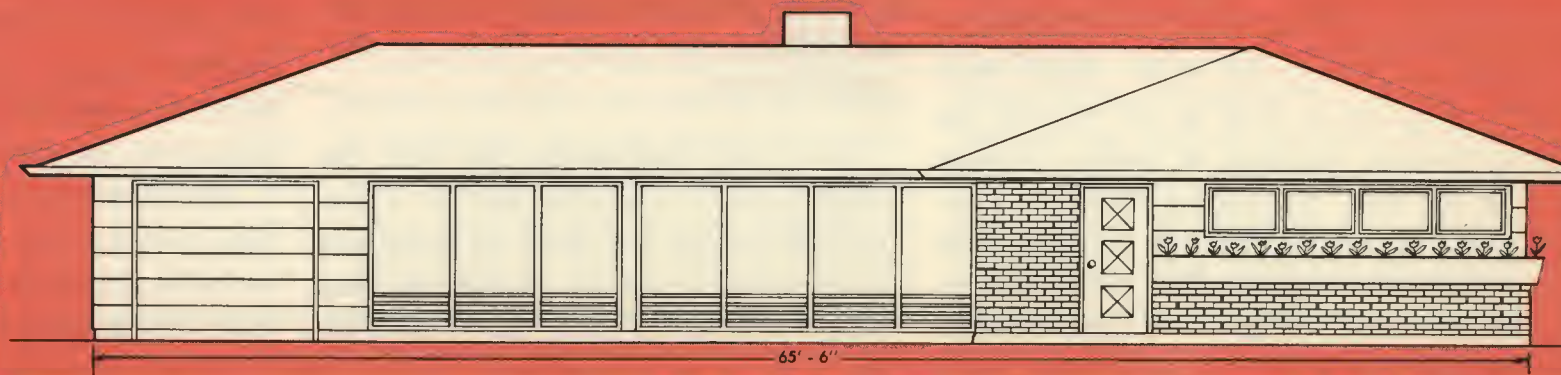
VARIATION B

build a basement under the ranch house and the reasons why you should or should not have a basement are fully detailed in the alternate plans. A concrete-slab floor, with either radiant heat or perimeter heat, can also be built underneath the ranch house.

Perhaps you will prefer the exterior of the ranch house finished in a traditional style, rather than the modern ranch-type style. There is no problem in doing this. As shown in the example here, the house can be finished on the outside with any

type of conventional siding. By changing only one other feature, replacing the windows with conventional metal or wood casements, you have a traditional ranch house. In such a case, you will obtain the windows or their exact sizes before framing the house and build the openings accordingly.

In either the modern or traditional version of the exterior, you can without complication add a pleasing wall of masonry to the ranch house if you use the new stepdown foundation wall detailed in the



VARIATION C



section on foundations. You can add the masonry now or years later, or even finish all exterior walls with the masonry veneer. The foundation gives a 4-in. projection of concrete beyond the walls. Either brick or stone can be built up the wall on this projection, requiring no special footings or the like. You simply place heavy asphalt paper between the masonry and wood sheathing and place metal flashing at the top to prevent water from entering.

Another important item in the design is that the roof of the garage is exactly the same width as the roof over the house at that end. This means that you can easily shorten the house to any length you desire. A single garage can be built, the breezeway can be left out, or the basic size of the ranch house can be built—you simply place the hip end of the roof wherever needed to complete the house in that length.

If you build the basic house as mentioned above, ending it with a hip roof, you will have a small, complete version of the ranch house. The basic house can also be ended with a gable roof *to give you an expansible house without complications*. Perhaps you have seen “garage” houses that are expanded by tearing out walls and moving kitchens and bathrooms—with all the problems of carpentry, plumbing, wiring and heating that crop up. Such problems are not only expensive but often result in your never having time to complete your home. There’s no such problem here.

As a test, your author first built the ranch house in the basic size. It is surprisingly simple. You build the living area of the house in the first plunge and then simply stop with a gable end to the roof.

The den area can be left open to be used as a carport, or completed as in the full house. Later, the gable end of the roof is merely continued on to form the breezeway and garage, ending with the hip roof. This expansion, given in detail in the alternate plans, requires no change in plumbing, wiring, heating or the like. Best of all, it will not disarray the part of the house in which you are already living.

Rearranging the rooms in the ranch house is quite simple because of the blessing of truss roofs. Most older roof construction requires support by both the exterior walls and by certain interior partitions called bearing walls. The modern truss roof requires support from only the exterior walls—it bridges the width of the house. Therefore, as you may have noticed, the living-room ceiling extends entirely across the width of the ranch house without support, and so can any other room—bearing walls are not needed. If, for instance, you desire to leave out the partition between the kitchen and utility room, making a large combination kitchen-laundry, no supports are needed.

Several ways to use the den area as a third bedroom are suggested herein. By including the half-bath shown in the alternate plans and by partitioning off the front

Unsanded plywood, first used in the foundation forms, is re-used on subflooring of house. John Whelan shows Riley how to lay out stud walls.

half of the breezeway — something that can be done later—you can actually have four bedrooms in your version of the ranch house.

WHY USE PLYWOOD?

You can build the entire ranch house of plywood. It should be emphasized here that you don't have to. Other standard building materials can be used inside and out, but the house is designed on an exact 4-ft. interior module so that it *can* be built easily of plywood. Why? In short because plywood is a handyman's material.

Plastering, for instance, is an almost impossible job for the beginner; but the novice can do as good a job as the professional on a paneled-plywood wall. With the dry-wall plywood construction practice is not essential. It is more of a job of "fiddling" or fitting the panels together.

Plywood has one major defect—it can be put on too easily! You have probably noticed the rough plywood walls inside some cheap dwellings and buildings. Because they will so quickly cover a wall, the plywood sheets are simply thrown up and tacked here and there to the studs.



They look fairly decent at the moment, so nothing more is done. The resulting warped panels, rusty nail holes and gaping joints that appear in time can give you a very poor impression of plywood paneling.

You also may have noticed the luxurious hardwood paneling used in the walls of the most expensive homes. Today, most of these are plywood, giving beautiful, durable walls with the warmth and luxury of hardwood. You can install these hardwood panels yourself. Also, especially when using the new dry-wall methods developed during World War II, you can obtain the same beautiful effects with the

less expensive plywoods now available.

There are a multitude of inexpensive plywoods and plywood finishes to choose from today. Common fir plywood can be used in several architectural treatments on the outside of the ranch house to give you low-cost siding that will not crack or split under the worst possible conditions. Room ceilings can be wood-paneled or given a "plastered" finish that equals the best plastering job and is crackproof. On the walls you can use common plywood in several ways or you can use the reasonably-priced specialties — vertical-grain fir plywood, redwood plywood, plyweave and striated plywoods. For wallpapered walls, com-



Combination table saw, with many uses in house construction, is being used here with a linen cutting wheel to score fieldstone for the hearth.

mon fir plywood gives an inexpensive, durable base for the paper. An enameled wall second to none can be obtained with vertical-grain fir plywood. All these details and finishes are fully explained in the steps of construction.

The plywood panels, properly installed, will both give you a good durable job and allow you to save a considerable sum of money by doing the work yourself. There are other advantages. Using the blond, or modern Swedish, finishes described later in this book, you will have



Tom and Vinita Riley move their table saw from room to room to complete cabinetwork. Here Tom cuts fronts for metal drawer inserts.

interiors that children cannot scuff or fingermark. This "plaster" cannot crack and it does not have the structural defect of wet-wall (plaster) construction—plaster introduces a tremendous amount of water inside your new home, thus expanding the wood structure and giving shrinkage and cracks later when it dries. And with plywood, your trimwork and cabinet work is simplified because there is no fitting to plaster.

Before you start to use any plywood in the ranch house, you should understand the grading of the various types so there is no mistake in either receiving or ordering the wrong type. The special finish

plywoods — the plyweave, vertical-grain fir, etc., — are made only for wall paneling and cabinets so have no complications. But the structural or common fir plywood that you will need comes in a variety of panels for different usages, *and today it has new grade designations.*

The common fir plywood comes in two types, the exterior panels, which are fully waterproof (bonded with phenolic-resin glue); and the interior panels, which are only water-resistant (bonded with casein or similar glues). The common plywood

also comes in various grades or surface finishes. Grade A-A, for instance, means both sides are free of defects. Exterior A-A is sometimes called "marine" plywood but will be stamped on the sheet "EXT A-A." Grade C-D means one surface has some open defects, the other has the largest defects permissible without loss of strength. An A surface may have neatly filled-in patches but it will always have a smooth surface overall for painting.

Note the illustration on page 18. These are the three fir plywoods you will use throughout the construction and, as they are so widely used today, these three are

also given special designations—plyshield, plypanel and plyscord—that are stamped on each sheet today to prevent any possible error.

Plyshield is the exterior type with an A and a C surface. It is completely waterproof and should be used on all exterior applications with its unblemished side exposed. There is no need of paying extra for two unblemished surfaces when one will go against your wall studs and roof overhang framing.

Plypanel is interior A-D plywood for wall paneling, cabinets, etc. It has one unblemished side and the other containing

large blemishes. Now, for such as cabinet doors you will need an interior A-A grade, as both sides of a door should be unblemished; but you can usually select clear portions of the plypanel grade for your doors. You see, just one blemish on a side can lower its grade from A to D, while the rest of the sheet may be perfect.

Plyscord is an interior-type plywood with a C and a D surface. Also, it is not sanded. In other words, a $\frac{1}{4}$ " in. interior panel of plywood with two blemished surfaces, C-D, when not put through the process of sanding down to a smooth surface, gives you $\frac{5}{16}$ " in. plyscord. This

A small electric router proves handy for the mortising of window frames and cabinets, hinging doors and V-grooving the plywood wall.



Hand electric saw is invaluable in framing the house. Here all roof boards on a side are nailed down and trimmed all at once with shallow saw.



The cost of power tools is saved in the window framing alone. Here Tom uses power saw to rip a window-frame member.



is the cheapest of plywoods, is very strong and should be used for all the rough work—subfloors, wall sheathing, roof gussets and the like. Plyscord is a fairly new grade, but any lumber yard that handles common fir plywood (plypanel and plyshield) will have or can obtain the plyscord for you. Also, it can be obtained today from mail order houses.

You may find another type of fir plywood in your lumber yard—"reject" panels. These are sanded sheets with one side or both below the D grading. By cutting out the defective spots, these are satisfactory to use in cabinets, but they are not recommended for the rough work, because the new plyscord is much sturdier and is usually lower in cost than even the rejects.

The common size of all plywood is the 4x8 ft. sheet and the ranch house is designed so that this size can be used throughout. However, say you widen the breezeway to 10 ft.—you can obtain panels in 10-ft. lengths to span the full width of your breezeway ceiling.

As already mentioned, the interior panels are "water resistant." Today, this means that they will stand the rain and exposure of the months of construction without any separation or other harm.

They are, however, not suitable anywhere on the outside of the house nor around the bathtub or shower stall. Here, the waterproof exterior type is used—today, it costs approximately 10 percent more than an equal interior panel.



Stakes are easier to move than a house, so try foundation layout first with temporary stakes.

POWER TOOLS

A skilled craftsman can hand-plane a board perfectly straight and square. Today, anyone can do the same job in a fraction of the time with the finish blade of a power saw. It is not necessary to have power tools in order to build the ranch

house, but you will find that a few modern power tools will save you so much time and labor and will give you so much better workmanship that they will be the best investment in the house.

Also, the window frames of the ranch house are designed so that they can be run on a handyman's table saw. If not, they must be run by a mill as is ordinary window framing. You can save the cost of most tools in this feature alone.

In building the test house, a table saw, a hand electric saw, a hand electric sander and a small electric router were found the most valuable, and in about that order. The author chose a ShopSmith 8-in. combination table saw. Any other 8-in. table saw would be satisfactory—the combination tool was obtained because it also had other uses and would make a compact workshop in the garage when the house was completed. For the hand electric saw, a 6-in. lightweight SkilSaw was chosen, and it proved as useful as the table saw. All framing and other heavy cutting can be done with any of today's hand electric saws, and you will find that they are the perfect tool for cutting large panels of plywood. A note here—the lightweight 6-in. size is ample in power and depth of cut for this construction. The more ex-

pensive industrial sizes are not necessary and, as they are heavy, are somewhat awkward for the beginner to use.

The electric sander to use is a matter of choice. There are several good types on the market and any of them will greatly reduce the chore of sanding down your finish work. The author chose a Skil 2½-in. belt sander and found this type excellent as it would do both rough heavy sanding and finish smoothing, but you can also use the vibrator or oscillating type

of sander. Here again a lightweight model is quite satisfactory and easier to handle than a heavy industrial size.

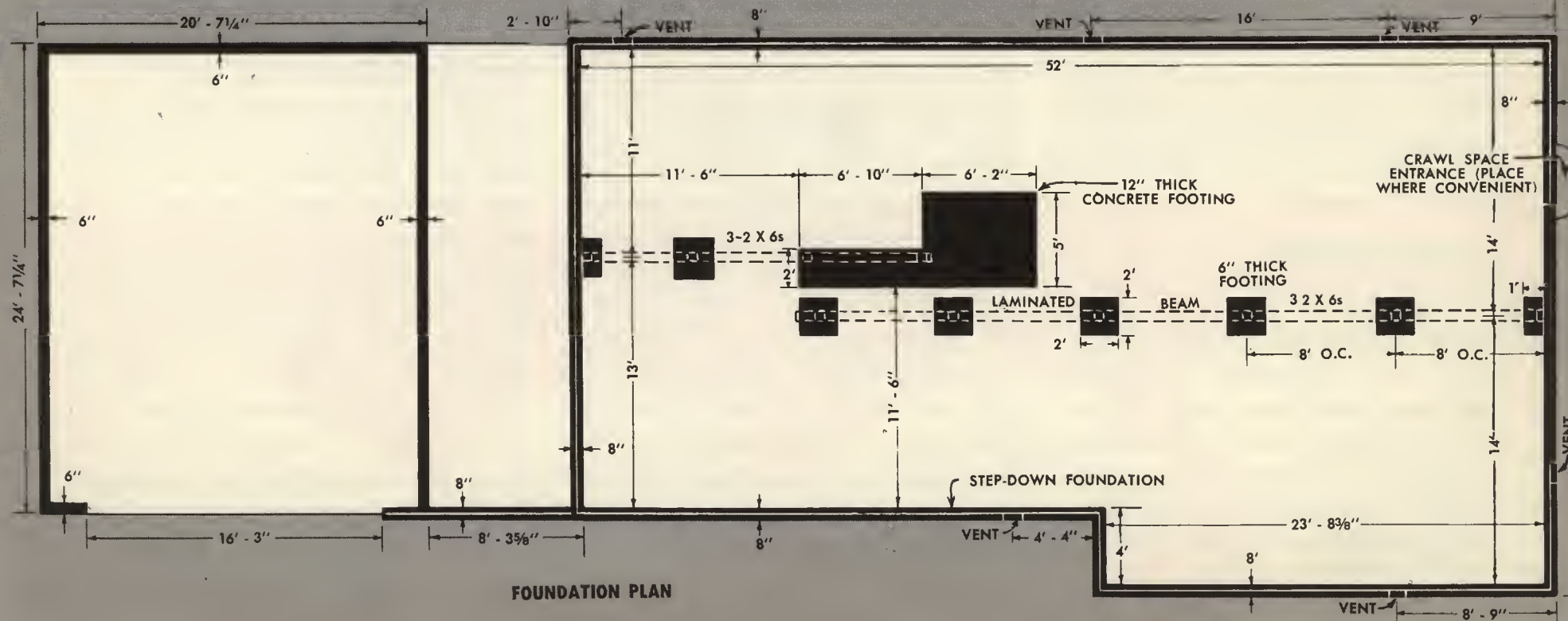
The author used a small Stanley router to good advantage in mortising the window and door frames together, routing out for door hardware and cutting grooves in plywood panels. These high-speed little tools are handy in many small corners and will give you precise workmanship.

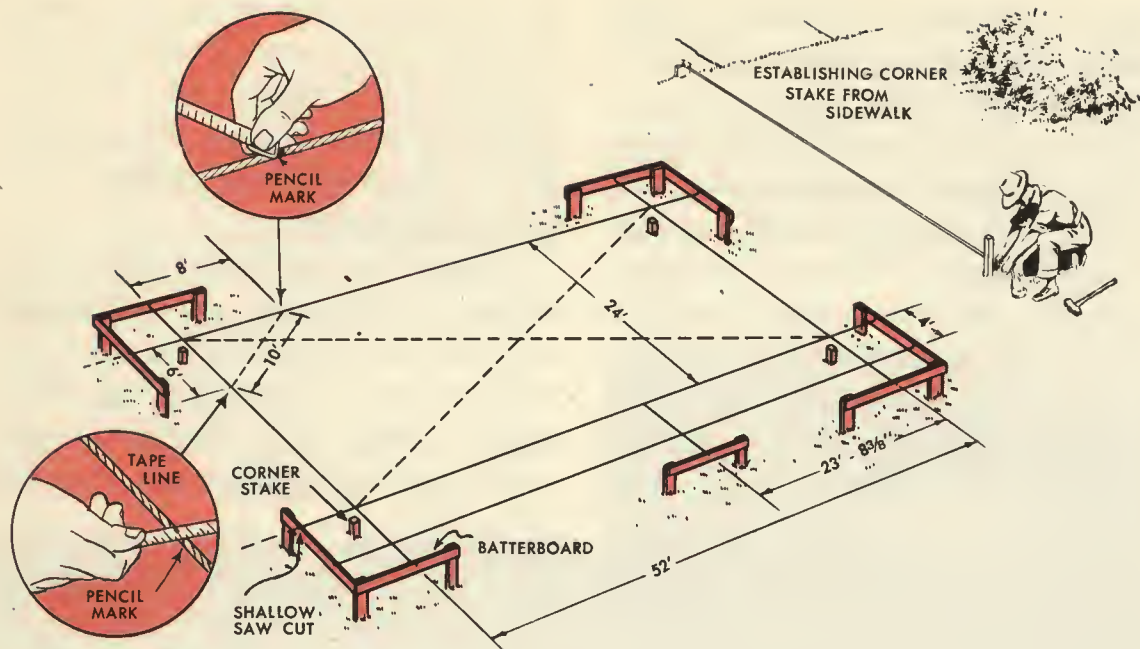
There are other power and special tools that you will need for a short time. These

can be rented. If you are not using ready-mix concrete, a small concrete mixer should be rented for that job. Tools for plumbing—wrenches, pipe dies and pipe vise—can be rented from hardware stores and plumbing shops.

To have the full use of your power tools at the beginning, you will need a temporary electric meter and service box such as you see on contractors' jobs. These can be rented, already assembled, from electric shops at a low figure and are simply

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How to locate the house precisely. Batterboards beyond excavation will serve as reference points.

heavy traffic on street, water available, electricity available immediately.

START OF CONSTRUCTION

Now you are ready to start your new home! On the following pages you will find the construction of the ranch house, including every detail necessary to complete it through the full 81-ft. size. Where to stop for a smaller version, the modifications for a basement, for a conventional exterior, for the prefabricated method of construction—all changes necessary for the other versions are given in the alternate plans in the back of this book.

The very first—and an important—part of the construction is to find the correct position of the house on your lot. Be certain you have checked your local building codes for any regulations that may apply to your home. Some codes require a certain setback from the street, an exact alignment with adjacent houses, a certain distance from the sides of the lot and the like. You should also take the precaution of having the lot surveyed accurately and when this is being done ask the surveyor to drive iron pipes or other permanent markers at each corner of the property.

mounted on a 10 to 12-ft. post sunk in the yard. When you install the house wiring, the temporary service box is taken down and returned.

SELECTING PROPERTY

If you do not already have a lot for your ranch house, you'll want to look for both a good neighborhood *in* which to build and a good lot *on* which to build. You are building a real home, so don't act hastily in selecting the site. Check into these things about the neighborhood—the nearness and quality of schools,

churches and shopping centers, the appearance of neighboring homes, the transportation, the taxes, the fire and police protection (from where?), the zoning ordinances (any factories, etc. allowed?), the sewers and utilities, the streets and who improves them.

On the lot itself, the size of ranch house you wish to build, the exposure you desire and the cost of the lot are the main factors. Also check into these items—the assessments and taxes, clarity of deed, building restrictions, possible rock or poor drainage, are curbs and walks in, any

Then you can precisely establish the corners of the house yourself by using the "right-triangle" method illustrated on page 24. This method is based on the fact that any triangle with sides 6, 8 and 10 ft. long must be a right triangle.

Before accurately staking out the house on a lot, take the time to pace off its dimensions roughly, outlining the walls with temporary stakes and string. Then call in the family to help visualize the completed ranch house where you have placed it. Would a view be better if your new home is placed diagonally on the lot? This is often done today, especially with ranch houses on large lots. Perhaps you will desire an asphalt turnaround or parking area as well as a driveway—then you will need to move the house back a few more feet. Or a large patio and view

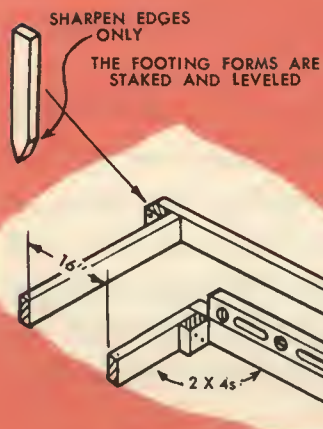
garden behind the dining room windows on a small lot—this wants the house as near the street as possible. Stakes are a little easier to move than a house, so plan out approximately what you will desire on the lot and place your new home accordingly.

To place the ranch house where you have chosen, use the lot boundary markers or a front sidewalk as a baseline for squaring the house on the lot. Measure in from the baseline an equal distance to drive the two front inside corner stakes of the building, 52 ft. center to center, and drive a nail in the center of the top of each stake. Level these two stakes with a line level or builder's level at the height you wish the top of the foundation wall. Next, the two rear stakes are set and leveled a like distance apart and 24 ft.

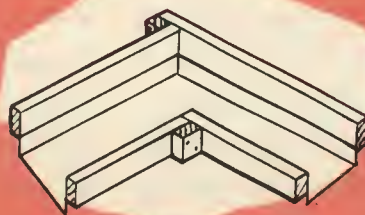
from the front stakes. Drive these temporarily at first until the 6, 8 and 10-ft. measurements coincide on a chalk line strung around all four nails. Then double check by stringing two chalk lines diagonally from the four stakes. These two lines should be equal. Also, the tops of all four stakes should be level.

Batterboards are now set up approximately 3 ft. behind each stake, as shown, and are leveled with the tops of the stakes. Note an extra batterboard is set up for the front wall mid-corner and that the front batterboards are made somewhat longer to care for the 4-ft. projection of the front wall. Last, the batterboards are notched in line with the nails on top of the stakes so that they will provide permanent reference points when the stakes are destroyed by excavation. These points

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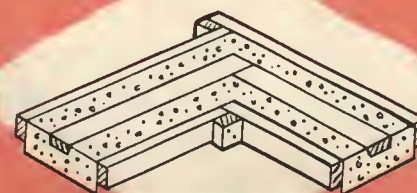
TRENCH IS DUG BETWEEN FORMS TO A 6-IN. MINIMUM DEPTH



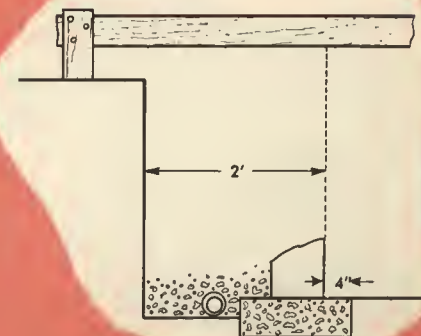
FOOTINGS ARE THEN POURED AND KEYS

GREASED 2 X 4s REMOVED WHEN SET

LEAVE FORMS IN PLACE



CHALK LINES GIVE INSIDE EDGE OF WALL



give you the exact position of the inside edge of the house's stepdown foundation walls, which will thus fit the house module.

The front and rear lines are continued on in the same way to "square-in" the garage and breezeway, but here you will measure out on the batterboards the width of a 2x4 (3 $\frac{5}{8}$ -in.) from both lines to have a width of 24 ft. 7 $\frac{1}{4}$ in., the outside edge of the garage walls. As illustrated, the garage walls do not use the stepdown foundation.

EXCAVATION

For the excavation of the crawl space, a power shovel or bulldozer is recommended. You can dig out the crawl space by hand, but digging in undisturbed ground is hard work and you will find that a power shovel or dozer can do the job in less than half a day and in most localities at a price such that you simply cannot afford to do this work yourself.

You actually have a choice of two types of foundation walls for your ranch house and the excavation is made accordingly. The stepdown wall shown on these pages is preferable because it solves the problem of keeping a ranch house low and snug to the ground, yet keeping the floor

joists a safe two feet above the soil of the crawl space. But, if your lot is in a swampy location that does not drain well, you may wish to use the alternate foundation wall that is shown in the basement alternate plan in the back of this book. Such a foundation wall built from frost level to two feet above the ground will require no digging out for a crawl space and thus is preferable in damp sites where pools of water would collect in the excavation. However, it is best to avoid such a location and to remember that the floor of the house in this case will be approximately 3 ft. above the ground level—the 2 ft. of the foundation, plus the floor joists and sill.

The crawl space for the stepdown foundation is dug 28 in. deep on a level lot in temperate and warm climates. As the footings under the outside walls must go below frost line, they may have to be 4 or 5 ft. down in some cold climates—check with your local or state building inspector for the frost-line depth. In such a case the basement alternate may be preferable for your ranch house because it does not require much more excavation. This is a major reason why basements are so prevalent in colder climates. Or you can dig the deeper trenches around the outside

walls only, leaving the earth floor of the crawl space at the 28-in. depth.

If your lot slopes somewhat—but less than 2 ft.—place all the footings on a level in trenches dug 28 in. below ground level of the lowest side of the excavation. If the lot slopes more than 2 ft. in the length of the house, deep trenches can be eliminated by "stepping." Dig 28 in. down on the uphill side for that foundation wall and for the crawl space excavation. Then dig a level trench for each of the other foundation walls down to frost level only, bringing the tops (sill level) of these walls to a level with the first wall. Thus, finished foundation walls of different heights will "step" up the steep slope to reach the sill level. Keep the footings under each wall level—do not slant them with the slope.

In any case, you should excavate approximately 2 ft. beyond the batterboard chalk lines to have room in which to build the concrete forms. If you have a power shovel doing the job, this may be a good time to have the operator dig a trench from the street to the house for the sewer line, which can now be laid into the house just below the footings and its trench backfilled. Or you can dig this narrow trench by hand anytime be-

fore doing the plumbing, at the present laying one section of 4-in. soil pipe underneath the foundation wall. Save all topsoil from the excavation for your lawn later on.

DRIVEWAY

It is good trouble prevention to decide right now—as soon as the excavating is completed—on where your driveway will go and have a load or two of gravel spread over its length. Thus you will not have the complication of hauling heavy materials in from the curb on rainy days when trucks bog down. And materials seem always to be delivered on rainy days! But do not pave the driveway until the house is fully completed; a heavy lumber or cement truck will more than likely break it. Simply spread a layer of gravel—it will not be wasted because the weight of vehicles over it will compact the roadway and give you a good base for future pavement.

FOOTINGS

Now you are ready to start the actual foundations. Anyone will tell you that this is the most tedious part of house construction, so do not be discouraged if progress seems slow. You must build the forms, handle heavy concrete and then tear out

all the forms you erected. The tediousness of all this is partially psychological; it doesn't seem as though you are accomplishing much because very little actual erection shows up in the foundations. But do not be afraid of spending the time to carefully position your foundations—if they are true and level you will save time throughout all the rest of the construction.

The footings are formed and poured first. Their forms should be positioned accurately because these are the easiest to place and are later used to align the wall forms. These 2x4 forms are staked down entirely around the excavation, 16 in. apart, and the inner form is extended out in two places to give the two 1x2-ft. projections shown in the foundation plan for the wall ends of the floor beams. A transit or engineer's level is usually used for leveling the footings, but you can do an accurate job with a carpenter's level. First, check your level by leveling it over a smooth surface or over two sharp edges and then reversing it end for end. If the bubble remains in the same position it is in good adjustment.

With the forms staked down, you next dig down 2½ in. between them to obtain a 6-in. deep footing in undisturbed ground. Now the concrete is poured; then



Power shovel or bulldozer can dig the shallow crawl-space excavation quickly and cheaply.

greased 2x4s with the edges bevelled are set in the wet concrete. The footings are screeded down to a smooth top by dragging a short length of board over the forms. Let this concrete cure for two days, keeping it covered with wet burlap bags or the like.

FIREPLACE FOUNDATION

You can pour the island-wall fireplace foundation and the post footings shown in the foundation plan at the same time you do the wall footings. The fireplace foundation can be formed of 2x6s and then dug down 6 in. to give its 12-in. thickness. The post footings are formed



of scrapboard to give 2-ft. square, 6-in. thick blocks, or you can purchase ready-made concrete footings for this use.

FOUNDATION FORMS

The $\frac{5}{8}$ -in. plyscord panels (the unsanded grade of fir plywood) that you will later use for the subfloor and roof gussets are "borrowed" here for the foundation forms of the walls. You can substitute $\frac{3}{4}$ -in. shiplap, a cheaper material in most localities, and also use it for the subfloor, but the saving will be fairly well lost by the amount of shiplap ruined in the forms. The plywood will save considerable labor, give you a smooth concrete wall and, later, the strongest of subfloors. First, spike a 2x6 plate to each 2x4 of the footing form as shown in the detail on page 29, spacing the 2x6s 8 in. apart, plus the thickness of your form material. For this and other form nailing, pick up 5 lbs. of 16d form nails, if available—their double heads will allow you to nail them in tight and yet pull them easily when wrecking the forms. Next,

Top, footings are poured first, then plywood forms are positioned for the foundation walls. Center, brace forms well. Bottom braces are extended over crawl space and staked to ground. Below, step-down boxes for floor joists are built on inner forms before outer forms go up.

sections of the inner form are built up and erected, each 8-ft. length of plywood making an easily handled section. The simplest way to build the sections is to nail a vertical 2x4 "stud" every 2 ft. and also flush with each edge so that the abutting sections can be nailed together through the doubled 2x4s. Cut your 2x4s to 8 ft. lengths so that they can be reused later for wall studs. To secure the plywood to the 2x4s, use only 6d finish or casing nails. Greater strength is not needed here and these nails can be simply pulled on through the plywood when wrecking the forms.

You will note from the detail that the lower edge of the plywood form hooks down $1\frac{1}{2}$ in. over the 2x6 plate. Do not nail the plywood to the plate, simply toenail the 2x4 studs to the 2x6s to hold the sections until braces are in place.

If your footing forms were level, the abutting edges of the plywood panels should be plumb and the top edges level, but check the sections as they are erected and block up where necessary to make them plumb. A final and most important check is to see that the inside form is exactly in line with the chalk lines of the batterboards.

Before you go too far, start bracing

these inner forms. The most important bracing is given on this page. Also take any other 2-in. stock on hand and fit it in for extra bracing—and be certain the bottom braces extend entirely across the crawl space to prevent any “kick-back” there. The rule to follow is that you can hardly brace a form too much.

A key point of the ground-hugging lines of the ranch house is the stepdown box which you will form in next. This box form is a simple 2x4 and shi lap box nailed to the inside form as illustrated.

Later on, the house sills will be secured to the foundations with concrete drive nails. If you prefer to bolt them down, you should at this time drill holes through the bottom 2x4 of the stepdown box every 8 ft. or less and secure $\frac{3}{8}$ x 12-in. bolts in the holes so that they will extend 10 in. down into the concrete pour. In this case nail the box to the inside form in such a way that you can pull the nails easily later on to tear down the wall form and bolted box separately. Bolts for the garage and breezeway sills are simply

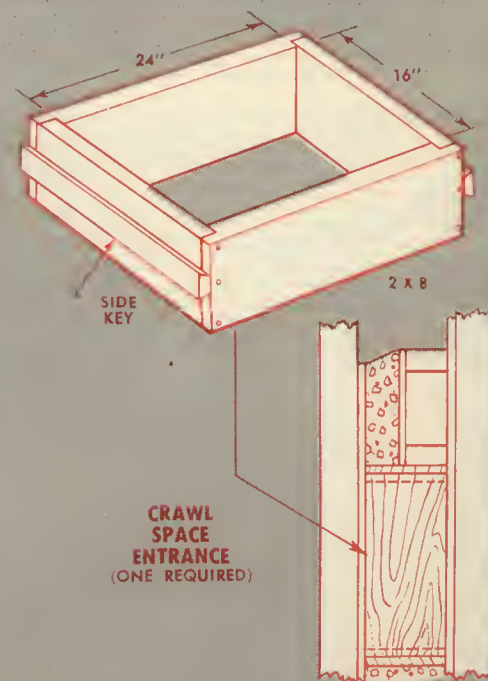
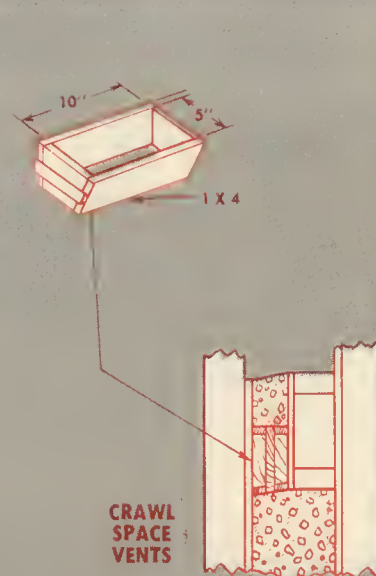
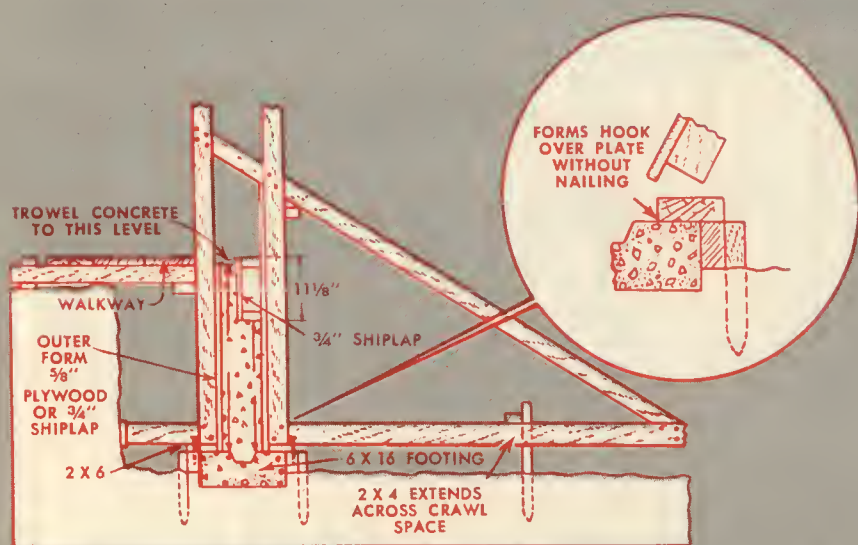
pushed into the top of the wet concrete.

The outer foundation form is built in the same manner as the inner form, but with the plywood sheets cut down to a 34-in. height. Do not be alarmed at cutting these sheets. They will lose little strength in their reuse later as a subfloor and any narrow strips left over will serve excellently as roof gussets. Have your 2x10 floor joist material on hand at this time so that it can be temporarily nailed down on the outside bracing to serve both as strengtheners for the form and as a smooth

A cross section of the step-down foundation.

Six of these crawl-space vent boxes are required.

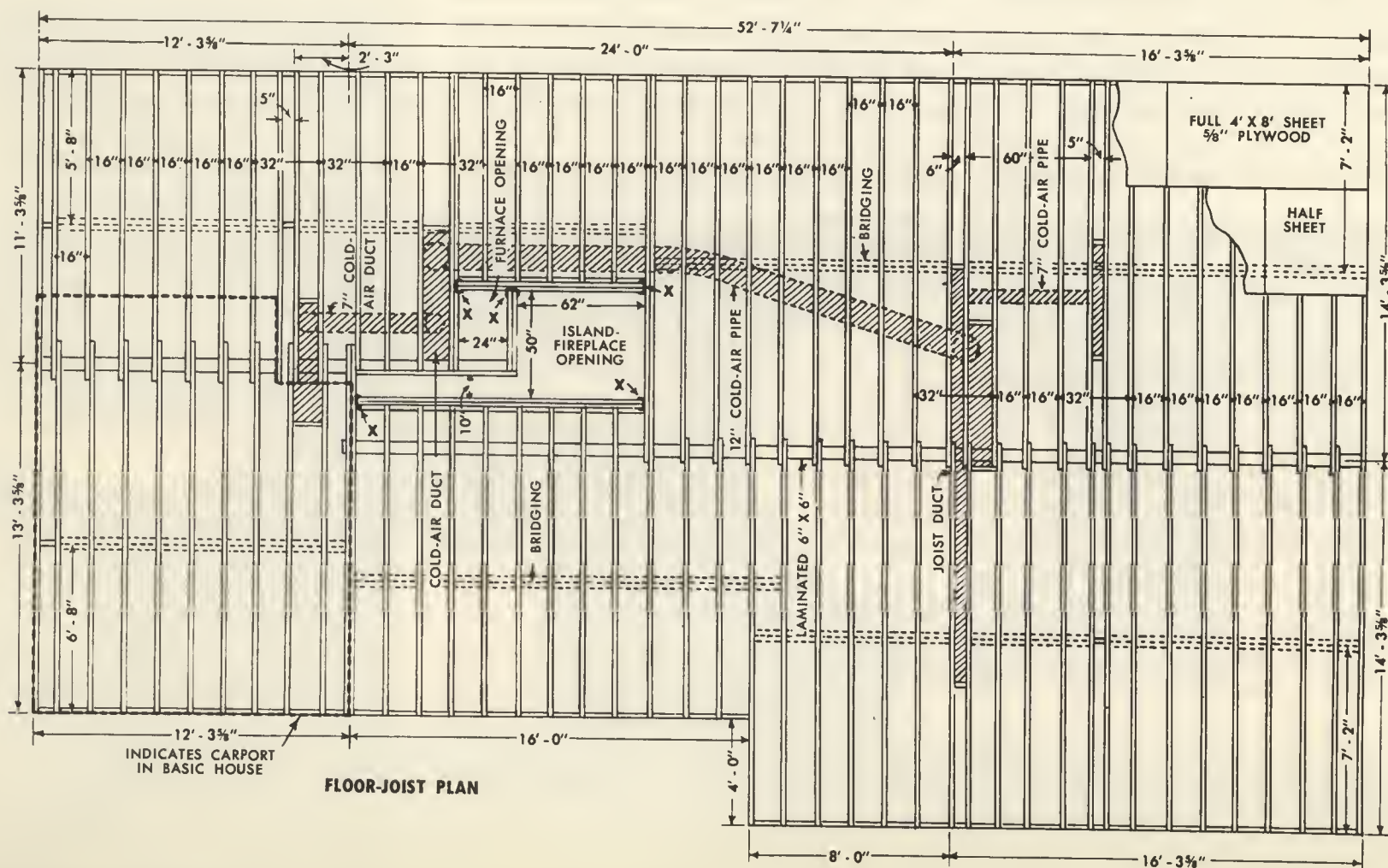
Crawl-space entrance is placed below joists.



You next make the crawl-space entrance box and the six vent boxes, or you can purchase ready-made vent boxes for this purpose. The boxes are secured in the forms by twisted wires and a few small nails. The entrance box permits access to the crawl space of the house and should

The garage and breezeway foundations do not normally require footings because they carry less weight. They need only a 6-in. wide trench dug down 18 in. below grade—or to frost level, if deeper—and they are formed above grade with 2-in.

planks on edge 6 in. apart. Note in the foundation plan that the 8-in. width of the front wall of the house is continued for uniformity on across the breezeway to the garage door. Build this one form to the 8-in. width. Unless the frost level of your locality extends down 2 ft. or more there is no need to trench at this time for



a foundation wall underneath the garage door and the rear slide of the breezeway. These can be poured integrally later on with the floor slabs.

POURING THE WALLS

If you have friends who have been itching to get their fingers on the project, now is a good time to call them. With transit-mixed concrete you will need two good helpers while wheeling the grout. With a concrete mixer on the job you will need two or three additional friends to help feed the machine. The transit-mixed concrete brought to the site on mixer trucks is preferred as you will thus obtain a truer and better mix.

Approximately 21 cu. yds. of mixed concrete is needed for the ranch-house

foundations. You have already used about 5 yds. of this in the footings and will now need the other 16 yds. for the walls of the house and garage. A 1-part cement, 3-parts sand and 5-parts gravel (1-3-5) mixture is satisfactory with ready-mixed concrete. If you make your own concrete in a rented power mixer, a 1-2 $\frac{1}{4}$ -4 mix is recommended, and the amount of water should not exceed six gallons per sack of cement, depending on the wetness of the sand.

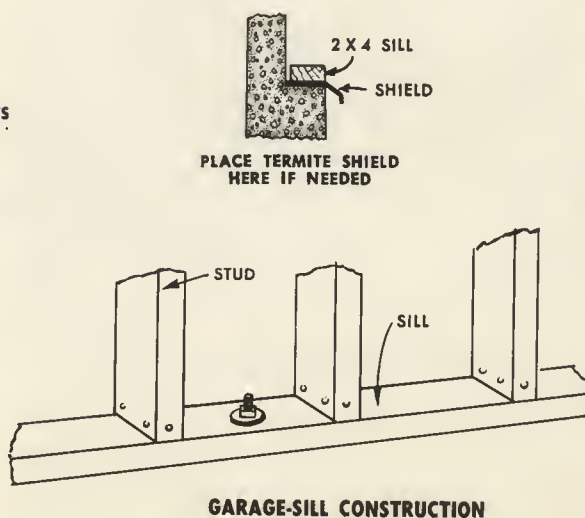
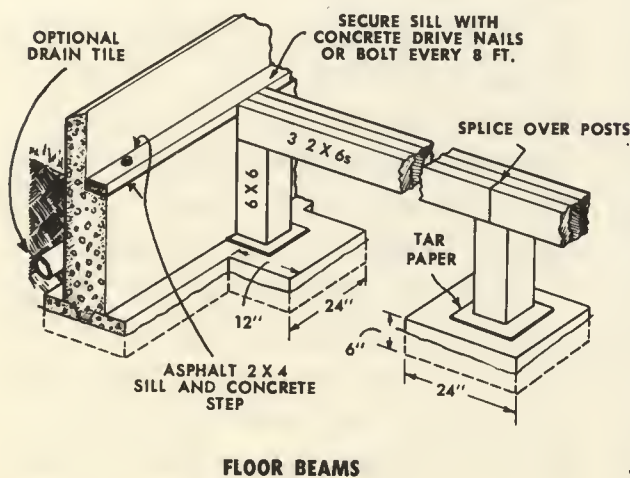
Whenever sand or gravel is delivered, a good trick used by contractors is to dump it on a sheet or two of the $\frac{5}{8}$ -in. plycord. You can thus scoop up the materials easily, and this unsanded plywood will not be harmed. Never attempt to

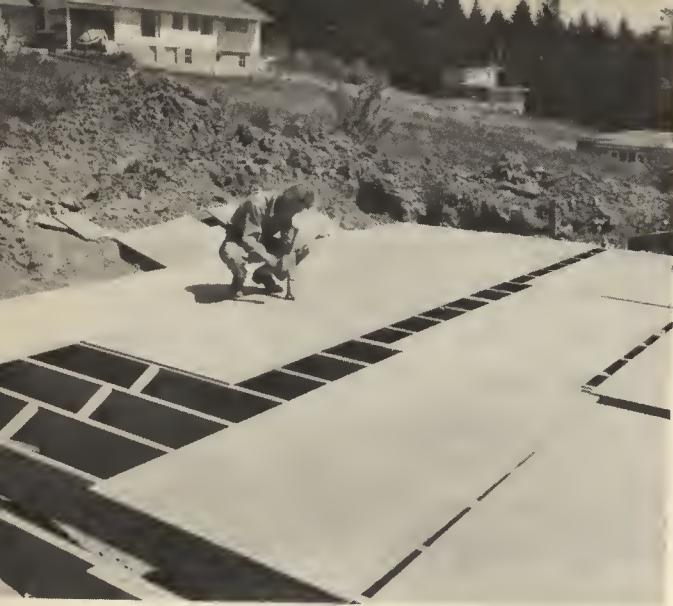
pour the concrete on a day when the temperature is near freezing. If poured at below 32 degrees, the wet concrete will freeze and its ingredients will crumble upon thawing.

Before filling the forms, wet the footings and sprinkle them with dry cement to assure a good bond. For this one-time use, it is not necessary to oil the plywood. Fill the forms evenly, not pouring all the concrete in one place. This keeps undue strain off your forms and bracing. As the concrete is poured it should be agitated or "puddled" to prevent voids in the finished wall, but you should avoid excessive agitation which will send the gravel

Assembling the laminated floor beams in place eliminates unnecessary moving of these items.

31

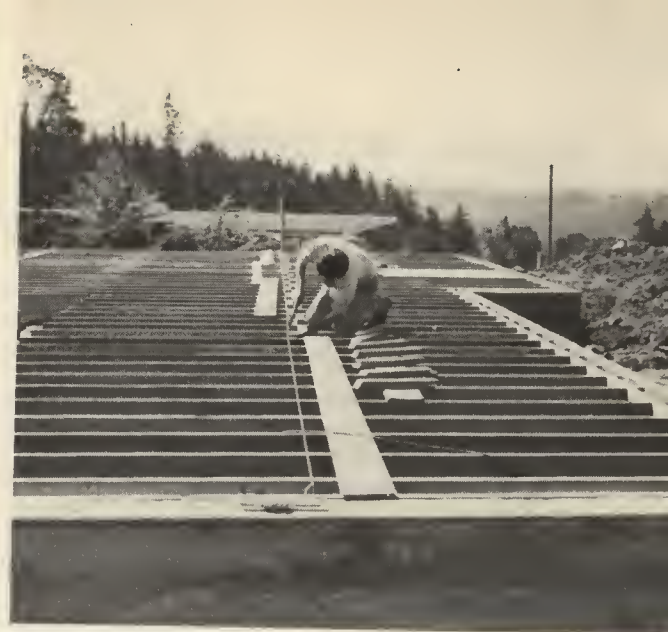




The subflooring should go in rapidly. The 4x8 unsanded sheets are crossed over floor joists.



Building a simple jig like this will allow you to cut all the bridging pieces needed in an hour.



Before placing bridging, align floor joists and brace temporarily. Note blocking between joists.

to the bottom and the cement to the top.

Pour the house walls to the level of the outside forms, let the concrete set slightly, then trowel it up on a slant to the level of the joist box. Smooth off the top of the entire job with a trowel—it is perhaps best to delegate someone especially to this job because when concrete begins to set it hardens rapidly. Before leaving it, lay boards over the top of the wall to give protection from a sudden rain and the direct sun.

BLOCK FOUNDATIONS

Though poured concrete is always preferable, you can use concrete-block foun-

dation walls under the ranch house, eliminating the form work of poured concrete. Eight or 10-in. building blocks are mortared together in courses over the same poured footing to the required height. How to build the stepdown ledge with blocks is shown on page 117. The completed walls should be well-waterproofed on the outside with a heavy coat of asphalt, because the mortared joints are very susceptible to water seepage.

FOUNDATION SILLS

Wait at least three days before stripping the forms and cleaning the material for reuse. Next, place the 2x4 sills—the first

of the actual framing—on the joist ledge and secure them with 16d or 20d case-hardened concrete drive nails driven into the still-green concrete. As these 2x4 sills lie in exactly the same position on the concrete as did the bottom 2x4s of the stepdown box, no grouting is necessary if you did a good job of leveling the forms. If not, lay the sill in mortar wherever necessary to make for any unevenness.

Brushing or troweling a thick coat of asphalt on the side and bottom of the joist ledge and painting the wood sill with pentachlorophenol or the asphalt paint is good architectural practice here, as well as at any other place in the house where a

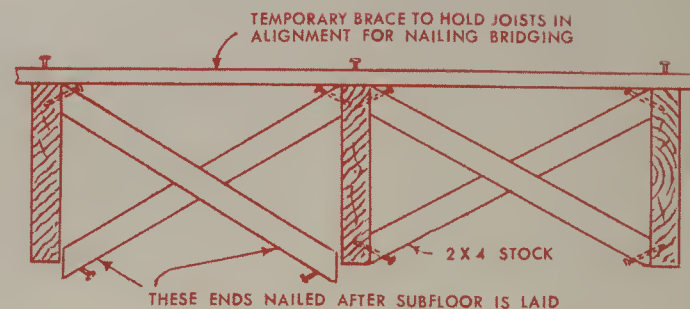
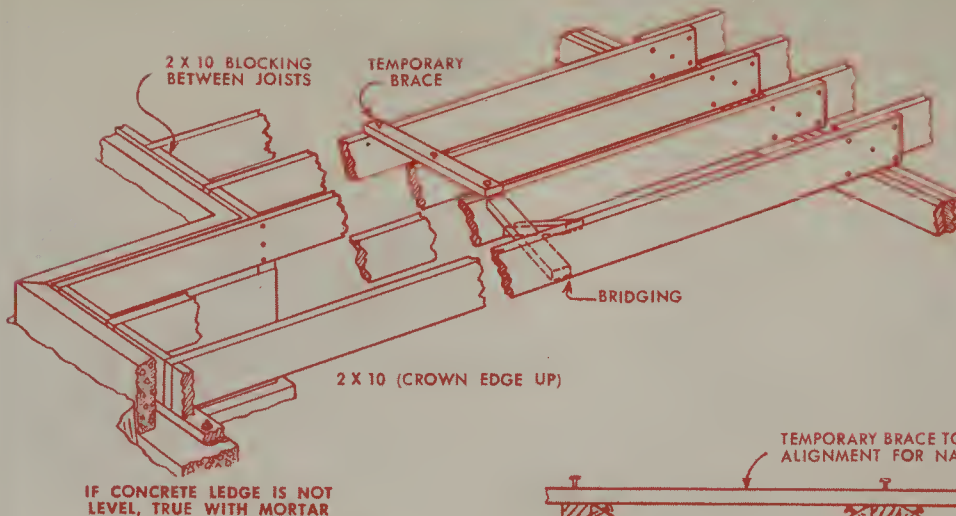
wood member rests on concrete. If you live in termite territory, place a metal termite shield between the concrete and the sill.

Now is also the best time to backfill around the outside of the concrete walls—to level the ground on which you will be constantly working. If there seems a probability of water draining downhill against the foundation walls in the winter-time, paint the outside of the walls with asphalt and place drain tile at the base of the footings before backfilling.

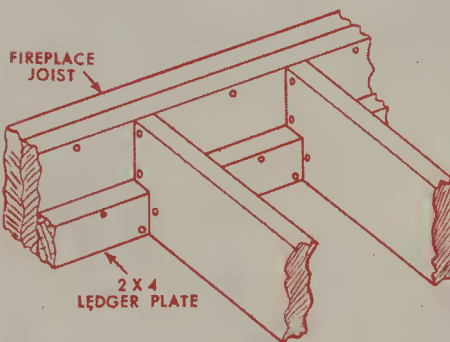
BEAMS

For the greatest strength from the lumber used, the floor joists are supported by two laminated 6x6 beams or lintels. These are built up from three 2x6s nailed together, and the 2x6s can be of any length as long as they butt together over an upright post. For the short upright posts, solid 6x6 cedar is preferred. Paint the bottom of each post with asphalt as you did the sills and lay a piece of heavy roofing paper between the post and its concrete footing to protect it from dampness. If needed, substitute a metal termite shield at this point.

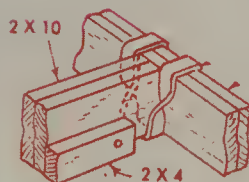
Assemble the beams in place, to eliminate handling a long, heavy beam. The beams are leveled to the sills of the house



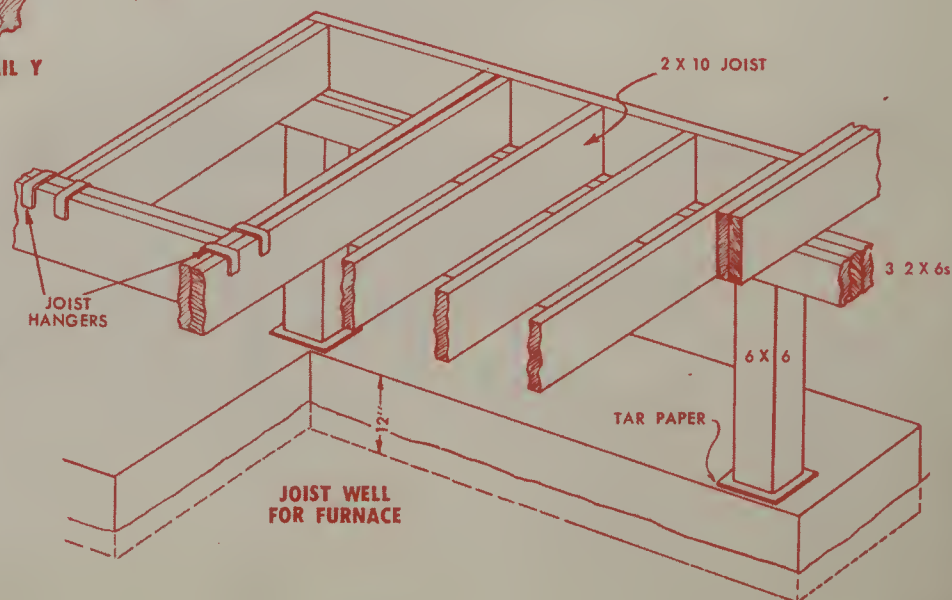
HOW BRIDGING IS NAILED BETWEEN JOISTS

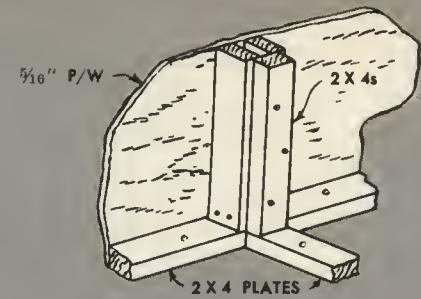


DETAIL Y

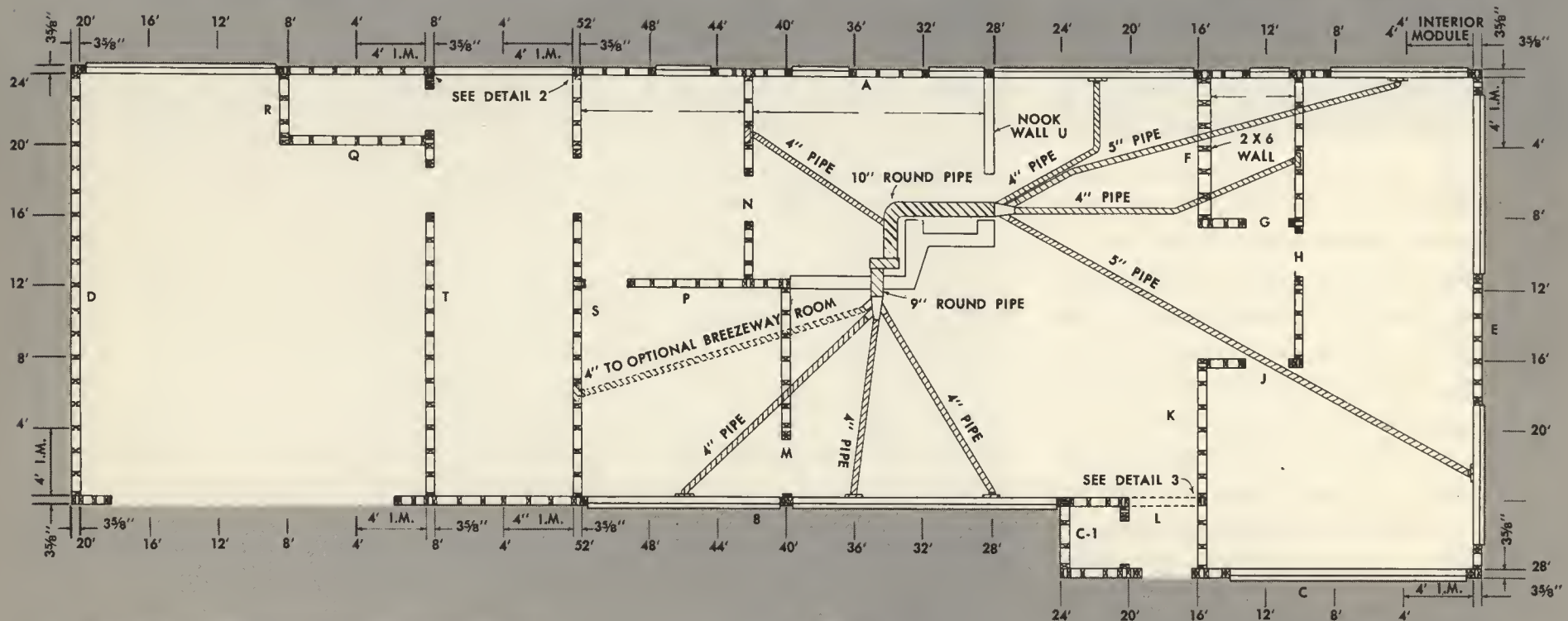


DETAIL X

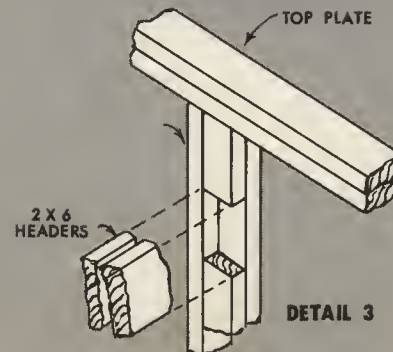
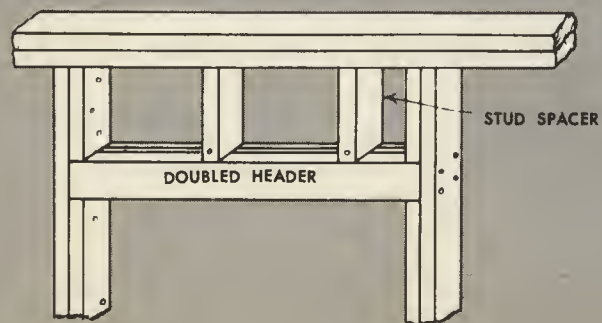




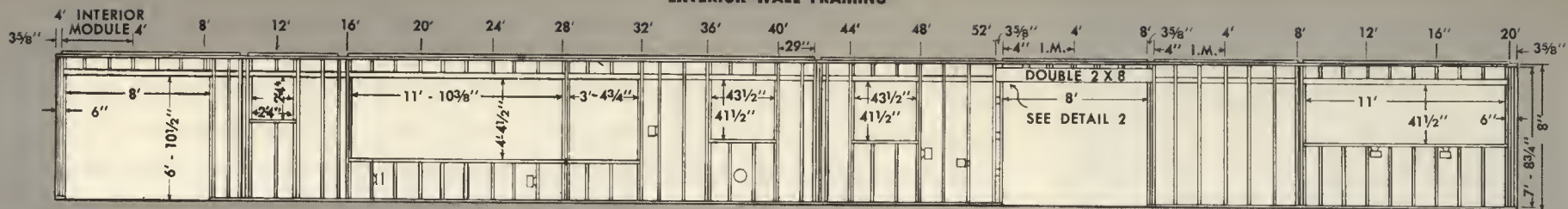
TYPICAL INSIDE CORNER FRAMING



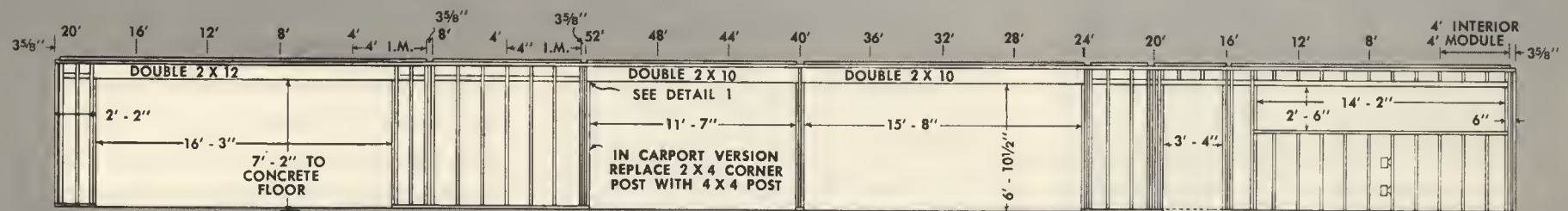
STUDDING PLAN



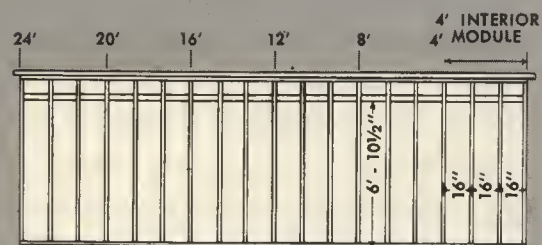
EXTERIOR WALL FRAMING



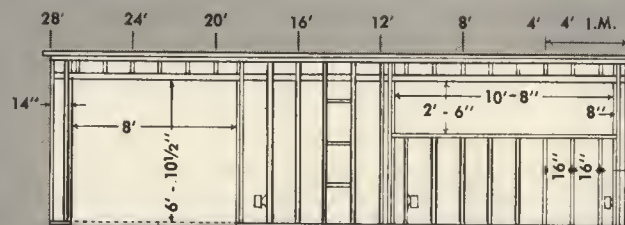
REAR WALL A



FRONT WALL B AND C



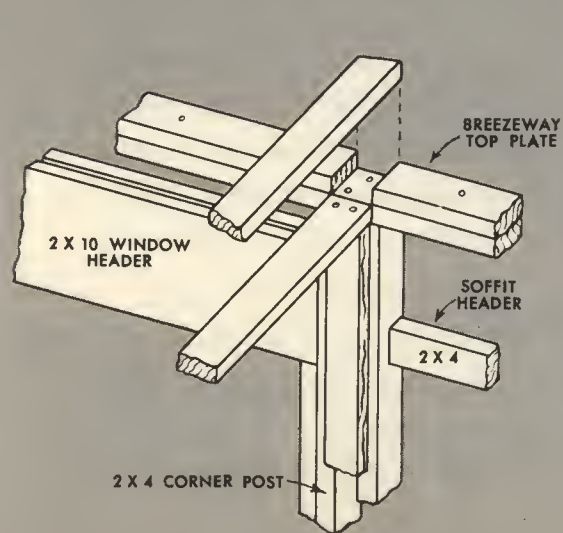
WALL D



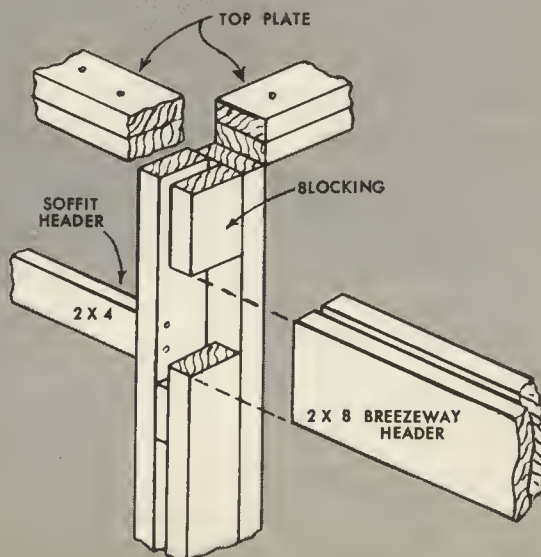
WALL E



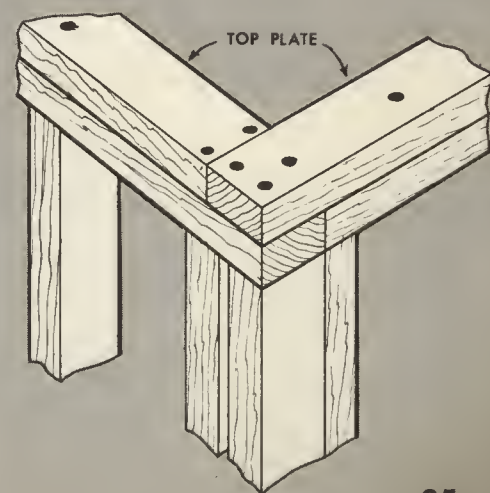
WALL C-1



DETAIL 1



DETAIL 2





The power saw cuts number of studs at once.

and are spiked to their posts but not to the sills. They "float" at the ends, and are given a $\frac{1}{2}$ in. air space between the ends and the concrete wall.

FLOOR JOISTS

All floor joists are 2x10 stock, spaced on 16 in. centers except where otherwise shown on the joist plan. The position of each joist is given on the joist plan; the lengths and number required are given in the material list. Note that the joists under the partition walls are doubled, some being blocked apart to leave openings for the plumbing and the furnace ducts. Joists

around the fireplace opening are also doubled, metal joist hangers being used at the points indicated, or, if these are not available locally, you can support them by nailing and cutting in 2x4 ledger plates as is done with the other joist ends at the fireplace.

If you live in the vicinity of lumber mills where it is convenient to order lumber of any "run," you can use the trick of ordering your floor joists "surfaced two-edge." Such 2x10 stock is not planed smooth on the sides and is, therefore, a full 2 in. thick, giving you an even more rigid floor in the house at no extra cost.

Between the ends of the joists and the concrete wall of the step, leave a $\frac{3}{4}$ -in. air space. Toenail the joists to the sills. Nail them together at the beams and also toenail them down to the beams. Scrap pieces of 2x10 blocking are nailed between the joists at their outer ends, except at the vent boxes where 2x4 blocking is used to leave an opening. Asphalt the wood members around each vent opening.

BRIDGING

Bridging the joists is next. The criss-crossing bridging that you see in houses, though seemingly flimsy, is important be-

cause it prevents "joist roll" and spreads any heavy weight over several joists, giving you a firm floor. Any common material can be used, from 1x3 to 2x4 stock. Usually, the cutting of the bridging pieces is quite a chore; but if you have obtained a small skillsaw, you can make a simple jig as shown in the photo on page 32, set the saw to the angle required and cut all the pieces accurately in less than an hour.

To line up the bridging, string a chalk line across the joists at the points indicated on the joist plan. Note on the joist plan that it is best to jog the rows of bridging to span the centers of different-length joists. Before nailing, check each joist for any twist by sighting from the end. Correct these joists by forcing them in line and then secure all of them in position with temporary boards nailed across the top. There is one trick with the bridging—nail only the upper ends of the bridging pieces at this time. You should not nail the lower ends until the subfloor has been laid, because then all joists will be more on a level.

SUBFLOOR

Your subfloor will go fast and consists only of nailing down the $\frac{5}{8}$ -in. plyscord panels you used in the forms. But do not

skimp on nails just because these sheets lay rapidly. Drive 8d common or box nails every 6 in. along the outside edge of each sheet and every 10 in. into the joists across the middle. Place the sheets as indicated on the joist plan. Save any scrap pieces of trim for use later as roof gussets.

There is an alternate method of laying this subfloor—when you intend to use cork or asphalt tile or wall-to-wall carpeting—that will save you approximately \$100 in the cost of the house and which is acceptable under most building codes. However, it does not give quite as strong a floor for tile or carpeting and is not necessary with wood-finish flooring. This method is to place the bridging as shown in the blueprints and to also place rows of 2x4 blocking on edge every four ft. between the joists. The blocking is placed flush with the tops of the joists. Thus the sheets of $\frac{5}{8}$ -in. plyscord can be secured along all their edges by nailing to this blocking, and a $\frac{1}{4}$ -in. second layer (underlay) of plywood will not be required later on for the tile or carpeting.

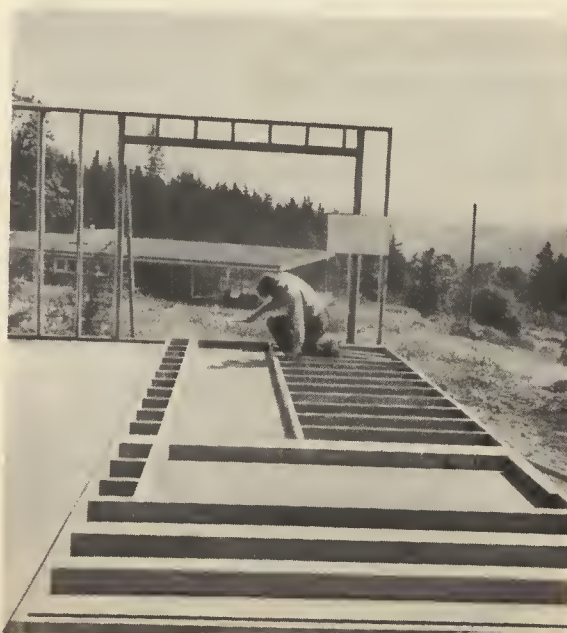
As mentioned earlier, you can substitute $\frac{3}{4}$ -in. shiplap boards for the subfloor. The shiplap should be sound and dry, and it should be laid diagonally. This will not give you as smooth and rigid a floor

as plywood but is quite acceptable, especially when you intend to use hardwood finish flooring.

WALL FRAMING

Now the walls of your new home can go up! Your wall framing is really fun. It progresses rapidly and you now see the house forming its actual shape. First, you will need approximately 276 2x4 studs cut 7 ft. 8 $\frac{3}{4}$ in. long to use in the walls—interior and exterior—of the house and the garage. With either a handsaw or skillsaw, it is best to set up some kind of a jig or pattern so that you can cut all of the studs to the same length without measuring each one.

Here Tom Riley frames in the master-bedroom clerestory windows in a wall section on subfloor.

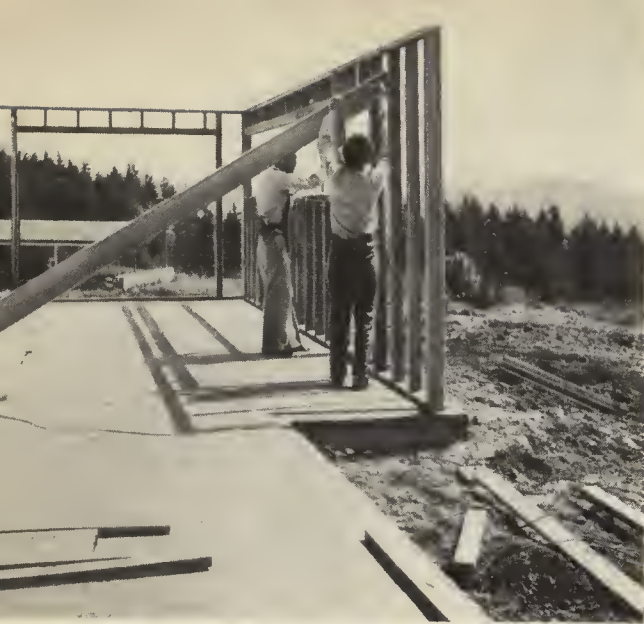


You should build the walls in 20 to 30 ft. sections that two men can easily erect. The walls of the house are erected first, then the garage. You will find it more convenient to completely “prefab,” completely frame each section while it is still flat on the subfloor. This deviates a bit from usual practice, where the sole or bottom plate is spiked to the floor first and then the studs are toenailed to it after the walls are raised; but built this “prefab” way your walls will be better nailed and square.

The position of every 2x4 is shown in the wall-studding plan and the stud spacing throughout the house and garage is on a standard 16-in. interval. The most

Wall sheathing is best applied horizontally. This is a fast, easy job with 5/16-in. plyscord.





Two men can easily handle 20 to 30-ft. wall sections. Window and door openings are framed.



Blocking for horizontally-applied sheathing is placed between studs 4 ft. above the subfloor.

foolproof way of measuring this stud spacing on the sole and top plates is to mark off the 4-ft. modular intervals given in the wall studding plans and then to step off the 16-in. spacings of the studs in between with a carpenter's square. Stepping off the full length of the wall with a square is not recommended because this allows small errors to accumulate.

Lay the sole plate and lower top plate of each section together on the subfloor and mark them both at the same time. Thus, they will match. Then spike the top plate and sole plate to the studs, nailing through the plates into the studs.

It is the most convenient to frame in

the rough window and door openings at this time—while the wall sections are still on the subfloor—and also to place all soffit headers and other blocking. In the window and door openings the doubled 2x4 or larger stock across the top is called a header. These are placed on edge instead of flat because they are thus more rigid. Scrap material, approximately $\frac{3}{8}$ -in. thick, is placed between the 2x4s for spacers, so that the built-up headers will be the same width as the 2x4 wall.

The dimensions of all window and door openings are given in the wall-framing plans. No extra width is left for window weights because no windows require them.

All side studs of both door and window openings are doubled with "cripples," scrap 2x4 material nailed to the face of the studs.

Note that most of the large window openings require only 2x4 headers above for rigidity. This is possible because the 2x6 members of the finish-window frame that you install later will serve as additional support. The soffit headers are scrap pieces of 2x4 blocking nailed between the studs of the exterior walls on line with the window headers, as shown in the wall-studding plan and detail. In all doorways the 2x4 sole plate of the wall should be continued on across the doorway. This is cut out later, is left in place now to give rigidity to the wall section while you are handling it.

A convenient place to erect the first wall is at the master-bedroom corner. Complete the wall section for the front half of the bedroom end of the house and raise this section in its place. Support it with braces nailed to blocks fastened to the subfloor and spike its sole plate down. Then erect the front wall of the bedroom and secure it in the same manner, spiking the two sections together at the corner as shown.

The corner should now be plumbed with a level or plumbbob and be held in

position with temporary braces nailed diagonally up the inside of the walls to the corner. Always place this bracing on the inside where it will not interfere with the sheathing of the wall. Nail the bracing to every other stud, and leave it in place until the wall sheathing is installed.

When all exterior walls are up and the corners are well braced, the inner walls can be framed and positioned, excepting the partition between the kitchen and dining room, which is installed after the ceilings are paneled. If you are uncertain about some modification in the rooms—such as which variation of the den to use—leave out that interior partition at the moment. After the other partitions are framed in, you can obtain a better idea of the room plan you desire.

An illustration on page 34 shows how these interior walls are secured to those already erected. Note that one wall of the bathroom is of 2x6 material so that it will be thick enough to contain the plumbing's 4-in. standpipe. Last, the top plate is doubled on all walls with another 2x4 plate. As shown on page 35, reverse the order of lapping the second plate at the corners and where joining an interior and exterior wall to obtain full strength.

Details 1 and 2, page 35, show you

how the breezeway is tied to the house. The other breezeway and garage framing is exactly the same as the house framing, except that the sole plate of the garage walls is also the sill that rests on the concrete foundation. This 2x4 plate should be either bolted or spiked with concrete drive nails to the foundation and should be painted with asphalt before erection.

The partitions inside the garage that form the two walls of the mud room will be continued on down to the garage floor; therefore these should not be framed in until the concrete floor is poured. A 2x4 sill, well asphalted, is then spiked to the floor and these studs framed in as elsewhere.

SHEATHING

Sheathing the exterior walls comes next. With the 5/16-in. plyscord specified in the material list, this is a fast, simple job. Also, there are two other sheathing materials which you can use, shiplap lumber and composition sheathing. The comparative prices of the three will vary according to where you live. The composition (wood fiber or gypsum board) is usually the cheapest; the other two are about

equal. Because a square ft. of plywood gives considerably more coverage than a board ft. of shiplap, the cost of plyscord at \$100 per 1000 sq. ft. is approximately the same as shiplap at \$70 per 1000 bd. ft.

The 5/16-in. plyscord is recommended as it gives you the best wall and an easily installed wall. It requires no corner bracing and without such bracing is at least 50 percent stronger than the diagonally laid shiplap sheathing. Also, it is wind-tight, has no knotholes or open joints. The 3/4-in. shiplap is second best. For full strength, it should be sound and dry and be laid diagonally on the walls. It re-



The plyscord sheathing is rapidly installed, gives the strongest of walls and is draftproof.

quires extra corner bracing—1x4s placed diagonally up the walls at the house corners, notched into the studs. As with plyscord, the shiplap can be used underneath any type of siding. Use 8d common or box nails to secure shiplap.

Composition sheathing — any of the various makes in 1/2-in. or 3/4-in. asphalt-coated 4x8 panels—is as simple to apply as the plyscord, except that it requires the same 1x4 corner bracing necessary for shiplap. It is windtight, without knot-holes or open joints, but has less strength than either shiplap or plyscord. It is not recommended for such exterior finishes as wood shakes because nails between the studs will not hold and, therefore, extra nailing strips would be needed. For the composition sheathing, use regular large-head 1 1/2-in. galvanized roofing nails, spaced 3 in. apart along the edges of the panels and 6 in. apart on intermediate studs.

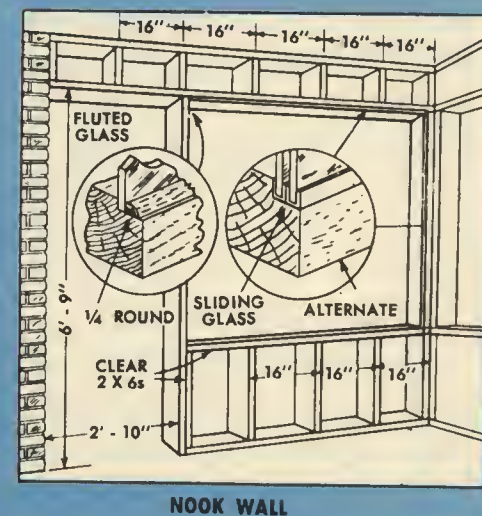
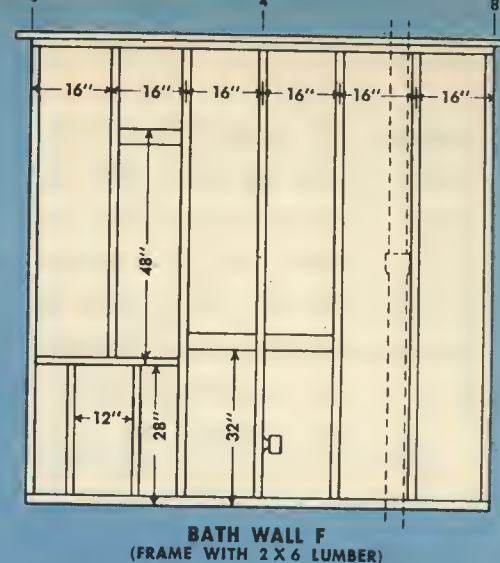
The plyscord is secured with 6d common or box nails, spaced 5 in. along the panel edges and 10 in. on intermediate studs. The 4x8 panels can be placed two ways, as can composition sheathing. The 8-ft. length can be placed vertically, cutting the panels off at the top edge of soffit headers and 2x4 window headers — this

wastes some material from each panel. Better, the 8-ft. length can be placed horizontally. For this a row of 2x4 blocking is placed between the studs at this 4-ft. height of the panels—as shown in the photos — to give a nailing edge for the sheathing on this joint. A 4-ft. high wall of sheathing can thus be placed entirely around the house with little or no cutting. The remaining sheathing between windows and the like can be filled in with odd pieces of plyscord, saving material; and the 2x4 blocking will also be of use as a firestop and as support later on for interior paneling.

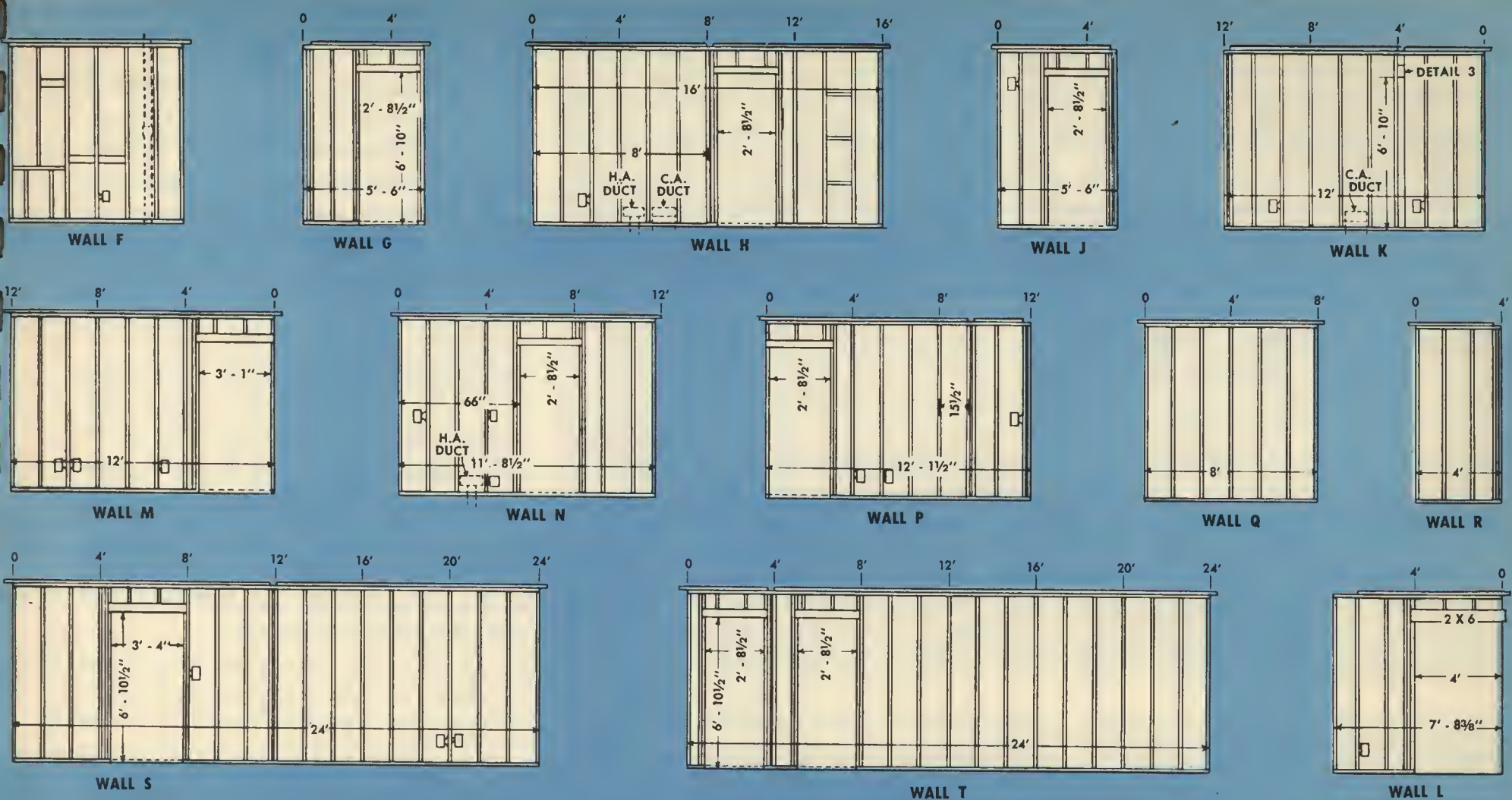
Whichever sheathing material you use, it should be cut flush with the rough openings for the doors and windows. At the bottom of the wall, the sheathing should cover the joint between the subfloor and the 2x4 sole plate.

TRUSS ROOF

Probably one of the greatest advancements in house construction today is the increasing use of truss roofs. Roof trusses are tremendously stronger than corresponding rafters, approximately 200 percent stronger, yet they actually require no more board feet of lumber than ordinary



raftering. Another important factor is that they give you ceiling joists that will not sag, allowing the ranch house's living room to extend completely across the house without special beams or bearing



partitions. There are, in fact, no main bearing partitions in the house.

From the amateur's viewpoint, the important thing is that trusses have now been developed to the point where they are simple to build. You will notice that the trusses of the ranch house require no spe-

cial ring bolts or tie rods—simple plywood gussets secure the members instead. And, using trusses, you will find the usually difficult chore of forming your roof up in the air—especially the start of the roof—is greatly simplified.

With trusses a somewhat different con-

struction procedure is followed. Formerly, you built your roof by first laying the ceiling joists on top of the walls and then carefully fitting a ridgeboard and hip rafters in the air to form a skeleton of the roof. Last, the common rafters were filled in. Here, you first build the trusses on the



ground, and then you erect them in a row to form most of the roof. Then the few ceiling joists necessary under the hip ends are filled in and, last, the hip rafters of the ends are fitted against the trusses already in place.

TRUSSES

To build the trusses, you first lay out a full-size master pattern of a truss on the subfloor of the living room with a chalk line or pencil and straightedge. The truss

Roof trusses are assembled in a form laid out on the subfloor and cross members are nailed on. Note that no special ringbolts are needed.

dimensions are given on page 44. Then scraps of 2x4 blocking are nailed alongside the outline of the truss, as shown on this page, giving a form in which to assemble and nail the truss members together. This form or jig will hold the corresponding members of each truss in exactly the same position for nailing and will thus give you identical trusses.

The truss material should be No. 2 or better common lumber. The members of one truss are carefully cut out. Note the 2x4 rafter members extend on out to form the roof overhang—are not trimmed at this time. The 2x6 joist members are cut on an angle to fit against the 2x4 rafter members. This first truss is not nailed together; its members are now used as patterns to cut the identical members of the 41 other trusses required. With one assistant you can do this the way experienced contractors do—a sort of assembly-line job. As fast as one man cuts the pieces with a skillsaw, the second man is busily nailing the trusses together in the form. Arrange a convenient cutting table with two sawhorses or the like on which to cut the members; close by the living room win-

dow opening is a good place. As each truss is secured with plywood gussets on one side, it is flipped over so that the gussets on the opposite side can be nailed. You will find it best to secure the side first that has the single ridgeline gusset—so that the truss will stay together when flipped over.

When cutting the gussets ($\frac{5}{8}$ -in. plycord) for the trusses, first use any scrap pieces of plywood left from the foundation forms and subflooring. These gussets are secured by 8d common or box nails. Note the nailing schedule given on the truss plan. Some truss members require only five nails at each end; others require nine. For strength, it is important that you use the correct nailing.

As each truss is assembled, it is stacked as shown on page 43, hung upside down between the front and rear walls of the house. Here it will be out of the way and ready to erect.

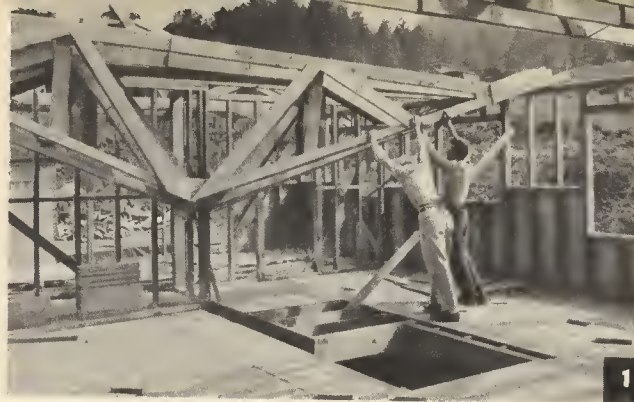
ERECTING TRUSSES

Two men are required to raise the trusses into place. First, mark a point on the top plates of the front and rear wall 16 ft. 3 $\frac{5}{8}$ in. from the bedroom end of the house. Then slide one of the upside-down trusses to this point and flip it upright with a pushpole or a rope and pulley

attached to a length of sturdy 2x4. This first truss is centered on the marks and is toenailed in place to the wall plates. Plumb and brace it in position with temporary braces to the top plates of the walls. Then three or four other trusses are raised at this same end of the house and are braced in position 16 in. apart, center to center, but are not toenailed to the plates as yet. Nail temporary roof boards near the ridge for extra bracing.

In the same manner, erect three or four trusses at the garage end of the house. Here, a doubled truss is centered 12 ft. 3 5/8 in. from the end of the garage. It is doubled to support the garage ceiling joists. With a few trusses thus positioned and braced at each end of the house, you will be able to string a chalk line between them to align the rest.

Top left, as the trusses are built, they are hung upside down between the front and rear walls. Top right, trusses are flipped right-side up with a pushpole or rope and pulley on a 2x4. Center left, roof boards are staggered so that joints will not fall on the same truss or rafter. Center right, hip ends of the roof are framed in after trusses are erected. Note that this hip has been spliced and braced by trusslike pieces. Lower left, ends of trusses and hip rafters are trimmed off with power saw to form roof overhang. Lower right, the ceiling joists under the garage hip are being notched to fit truss plates.



As shown on the truss and rafter plan, 42 trusses are needed and they are all placed on 16 in. centers except where otherwise indicated. Note that each side of the chimney opening has a double truss. The last six or eight trusses should be flipped upright at the same time, piling them temporarily against those already erected, so that space for turning over the last three or four trusses will be available.

The row of trusses is now aligned by the chalk line strung between the two end trusses, and then all trusses are secured to the wall plates by toenailing with 16d nails. As shown in the photos, one man climbs among them to check the alignment, while the second man taps the overhang of the trusses with a sledge or heavy piece of lumber to move the tips directly under the chalk line. Note that the front

ends of the first six trusses rest on the partition wall of the vestibule closet and the header over the entranceway. The overhang of their 2x4s should be cut off as shown.

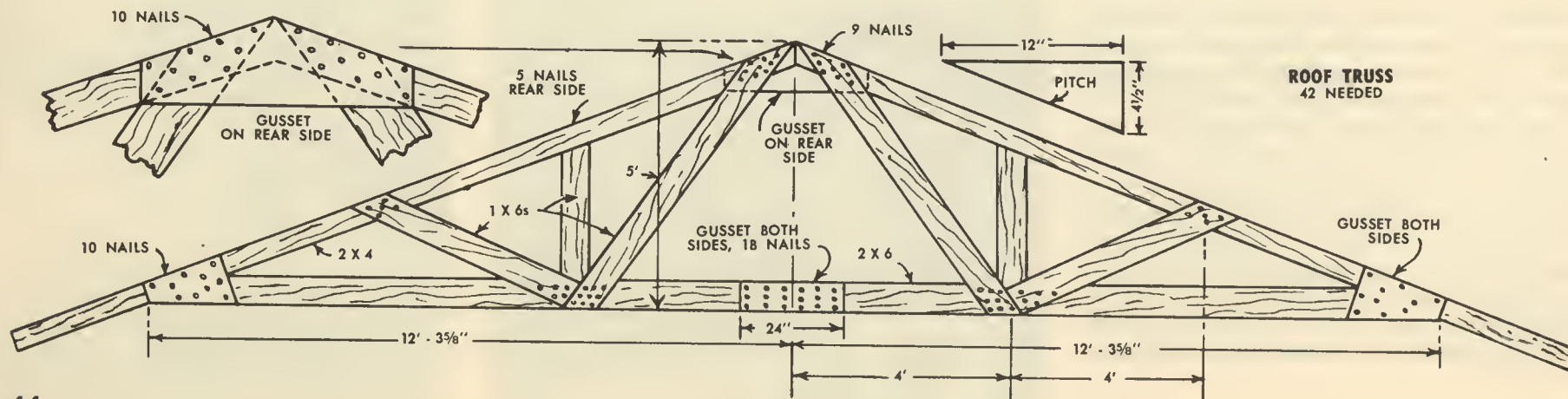
CEILING JOISTS

With the trusses all in place, the next job is to position the few ceiling joists that are needed. Note in the ceiling joist plan that there are two rows of ceiling joists, one at each end of the house, both placed at right angles to the trusses for maximum strength. On the garage end, 16 2x6 joists are used, and a 1x6 and a 2x2 are first nailed to the last doubled truss, as shown in Detail B, to give a ledger plate on which the joists can be butted and nailed. The middle joist in the garage is left out to give an opening into the attic.

Over the bedroom end of the house, 21 ceiling joists are placed, nine 2x8x16 ft. and twelve 2x6x16 ft. These joists are butted and nailed to the first truss. Where this first truss extends across the hallway space, a ledger plate is first nailed to the truss, as in Detail B, then the joists are nailed to it.

Note that six more joists span the ceiling of the vestibule and vestibule closet. Only 2x4s are needed here because of the short span. The last joists are the four 2x6s that fill in the space left between trusses at the chimney opening.

The outer ends of all ceiling joists are trimmed off as shown in Detail A of the joist plan. This can be done roughly with a skillsaw or hatchet because it will be hidden. Note the row of solid bridging, scrap pieces of 2x6 material, shown in the



joist plan at each end of the house. This bridging or blocking is staggered so that you can easily nail into the ends of each piece. Though not absolutely necessary because of the ceiling paneling method that will be used, it is also good construction to place two similar rows of bridging between the ceiling members, 2x6s, of the trusses. These are placed approximately 8 ft. out and parallel to the front and rear walls of the house.

RAFTERS

Now you will frame in the chimney opening and the two hip ends of the house with ordinary rafters. The truss and rafter plan on page 48 shows the position of each rafter needed.

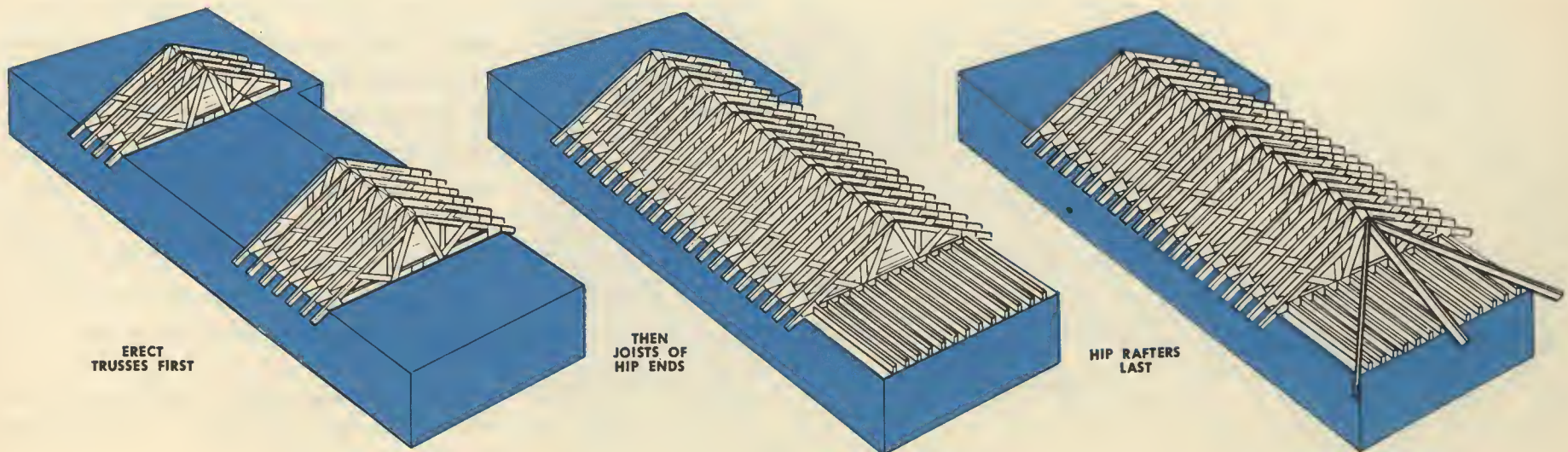
First to be placed are the short ridge-board, the doubled crosspieces and the four common rafters of the chimney opening. Note that these are 2x6 rafters, instead of the 2x4 rafter members of the nearby trusses (because these are not a part of a truss). At the wall plates, these rafters are notched as shown so that they will not be higher than the 2x4s of the trusses.

All other raftering consists of enclosing the two hip ends of the house. This will tie the roof together in a solid whole that is rigid in every direction. First you will need nine common rafters and six hip rafters, cut as shown. Note that one hip rafter is cut differently than the other five.

These hip rafters are quite long, 22 ft., and may not be available in your lumber yard in this length. If so, splice a 6 ft. length of 2x6 to a 16 ft. length with $\frac{5}{8}$ -in. plyscord gussets as was done on the ceiling joist members of the trusses. Place the splice toward the lower end of the hip, and if you desire, place truss cross members underneath as shown in the photo on page 43, to give extra strength.

Note how these 2x6 rafters are also notched at the wall plate to be the same height as the 2x4 rafter-members of the trusses.

On the garage hip, first place the common or end rafter, as shown on page 50. Then the two hip rafters of the garage



roof are nailed in. Note in the circular detail how these three rafters are fitted together. Complete the hip by filling in the jack rafters, spacing them by nailing them alongside the ceiling joists at the end of the garage, and on 16 in. centers on the front and rear walls. As you work down the hips, you can continually cut four jack rafters the same length, one for each side of each hip. If your roof is off a $\frac{1}{2}$ in. or so, and two jack rafters thus do not meet exactly at the same point on the hip, this will not affect the strength.

On the bedroom hip, you will first place

the 4-ft. 2x6 extension of the house ridge line and then the common end rafter that is in line with it. Then the three common rafters and the hip rafter on the rear side of the house can be placed.

Next, the 4-ft. 2x6 that forms the ridge of the roof's short "L" is positioned and the end rafter is placed in front of it. Braces from the ceiling joists below can hold this ridge temporarily in place. Then the two hip rafters here at the front of the house are fitted in as was done over the garage.

Before starting the valley, you can go

ahead and fill in the other common rafters and jack rafters of this roof. Because a valley is usually the weakest part of a roof, it ordinarily requires a 2x8 valley rafter; but because this valley is supported throughout most of its span by the trusses, you need only to snap a chalk line from the turn in the ridge to the corner of the front wall and fill in between the trusses with a line of 2x4 blocking. The drawing on page 48 shows all the valley members; the detail further clarifies its framing. Note that the short upper section of the valley is framed with 2x6 material because it is not supported by the trusses. The other valley jacks are of 2x4 material. The circular detail shows how these are notched to rest on the trusses.

The pitch of the ranch house's roof is $4\frac{1}{2}$ to 12. This is the minimum pitch you should use with shingles and most tiles; and, being low, it adds considerably to the ground-hugging lines of the house. If, however, you prefer for any reason to have a steeper pitch—say you are building on a highly-exposed seacoast and want maximum protection from wind-driven rains—the truss pattern can be changed. This is not difficult. By making the trusses

With several trusses erected at each end, a chalk line can be strung to align all other trusses.



Tap the ends of the trusses with a sledge or a heavy board to place their ridge points directly under the chalk line. Here the test ranch house is shown in the basic size, before its expansion.

5½ ft. high instead of 5 ft., you will obtain a pitch of approximately 5 to 12. Making them 6½-ft. high will give approximately a 6 to 12 pitch. This is the only change necessary in the trusses—the difference up to a 6 to 12 pitch will not affect the cross members of the trusses enough to require realigning them. With the steeper roof, the hip rafters and jack rafters will need be slightly longer. You can figure the new length with a raftering square, as carpenters do; but, because the hips do not lay out the skeleton of the roof but are simply filled in last, you can simply measure the lengths needed and cut these rafters to fit. A steeper pitch than 6 to 12 is not recommended because such will change the architectural lines of your ranch house and will add considerably to the amount of roofing needed.

ROOF OVERHANG

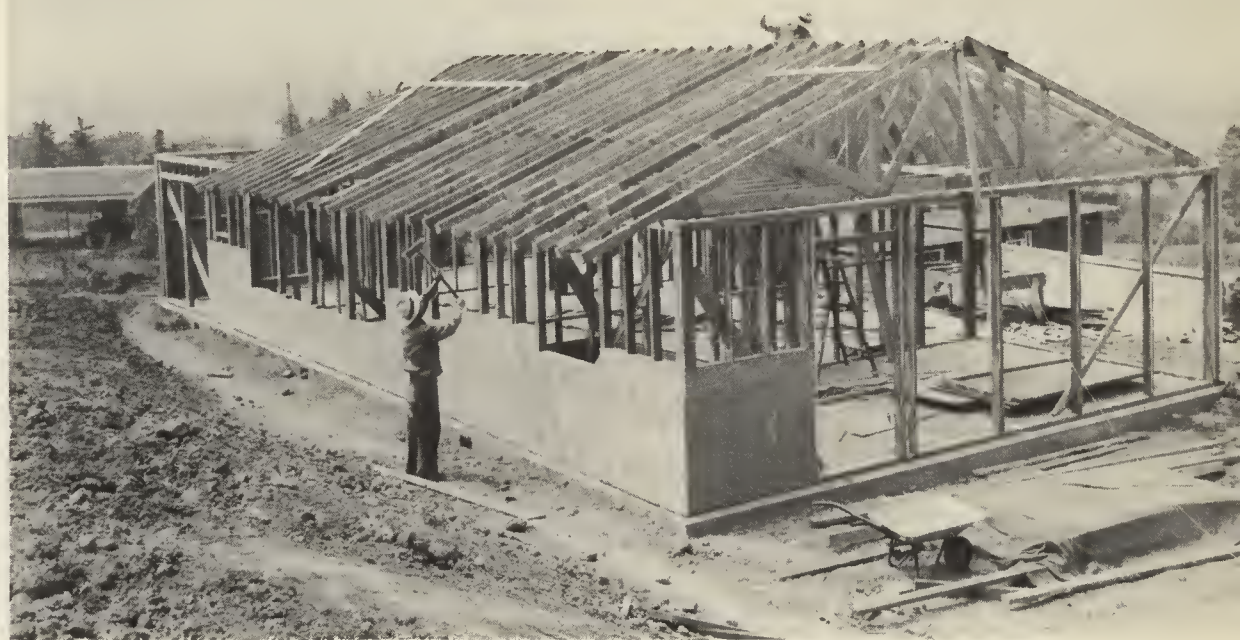
The ends of the trusses and other rafters are now trimmed off to form the roof overhang. You can do this work from a low stepladder, but it is better to take the time to throw up a low, temporary scaffolding,

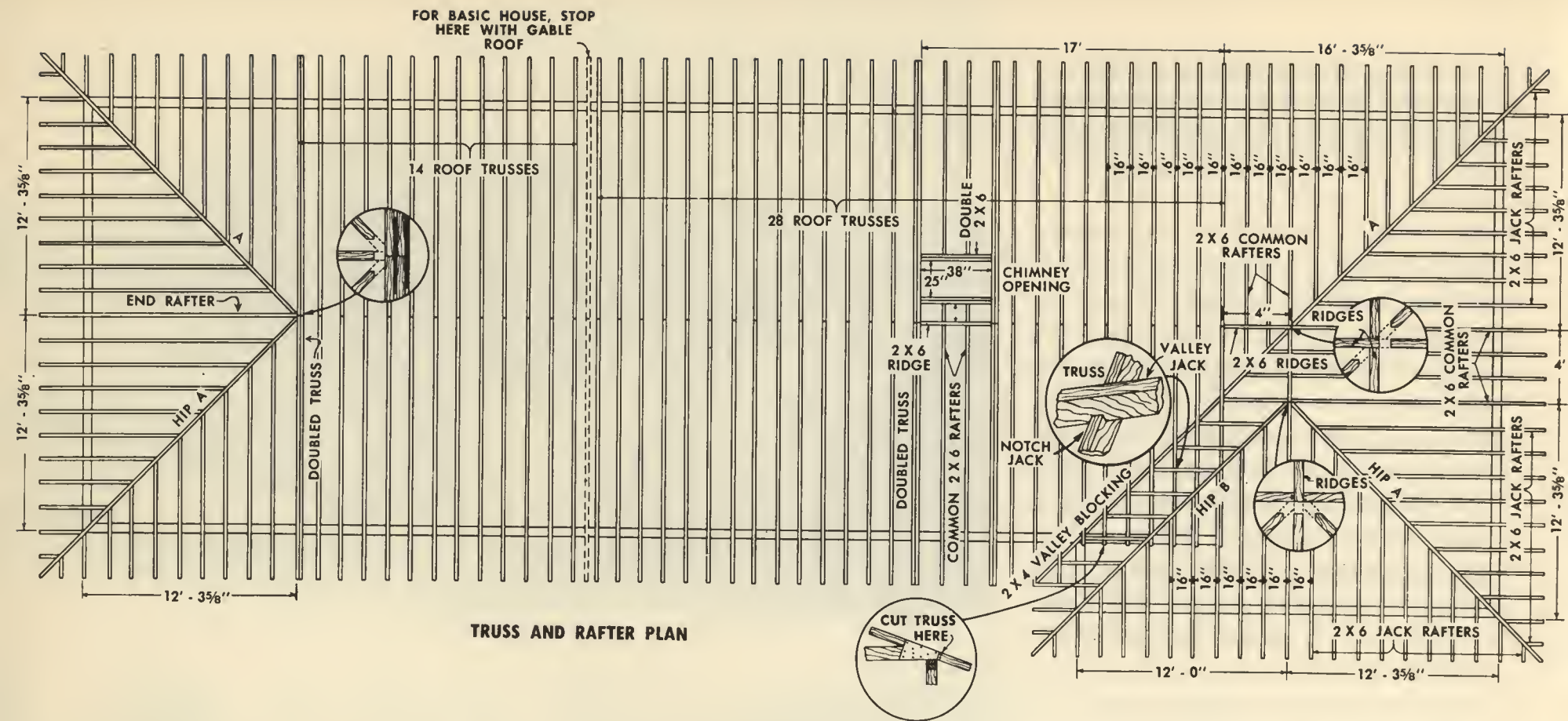
as shown on Page 51, so that you can work comfortably—there's a considerable amount of trimming and framing here.

The drawing shows how to establish the distance out from the walls to make the cuts—by leveling out with a 2x4 from the soffit headers. This distance will be approximately 30 in. By leveling out in this manner, rather than just measuring out 30 in., your soffit or underside of the overhang will be true, regardless of any small discrepancies in the walls or rafters. Note that the cutoff line is 1⅝-in. back

from the mark to leave space for a 2x4 fascia member. Level out in this manner on a rafter at each end of a wall and drive a nail on the mark. Stretch a chalk line between the nails, chalk it and snap it to mark all intervening rafters. Then, with a level, draw a vertical line at each mark and saw off the rafter ends with a skillsaw or hand saw. The slight projection of the 2x6 rafters below the crosspieces should also be trimmed off. This can be done roughly with a hatchet as it will not show.

Next, the 2x4 crosspieces for the soffit





TRUSS AND RAFTER PLAN

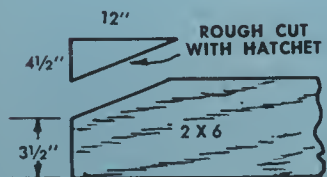
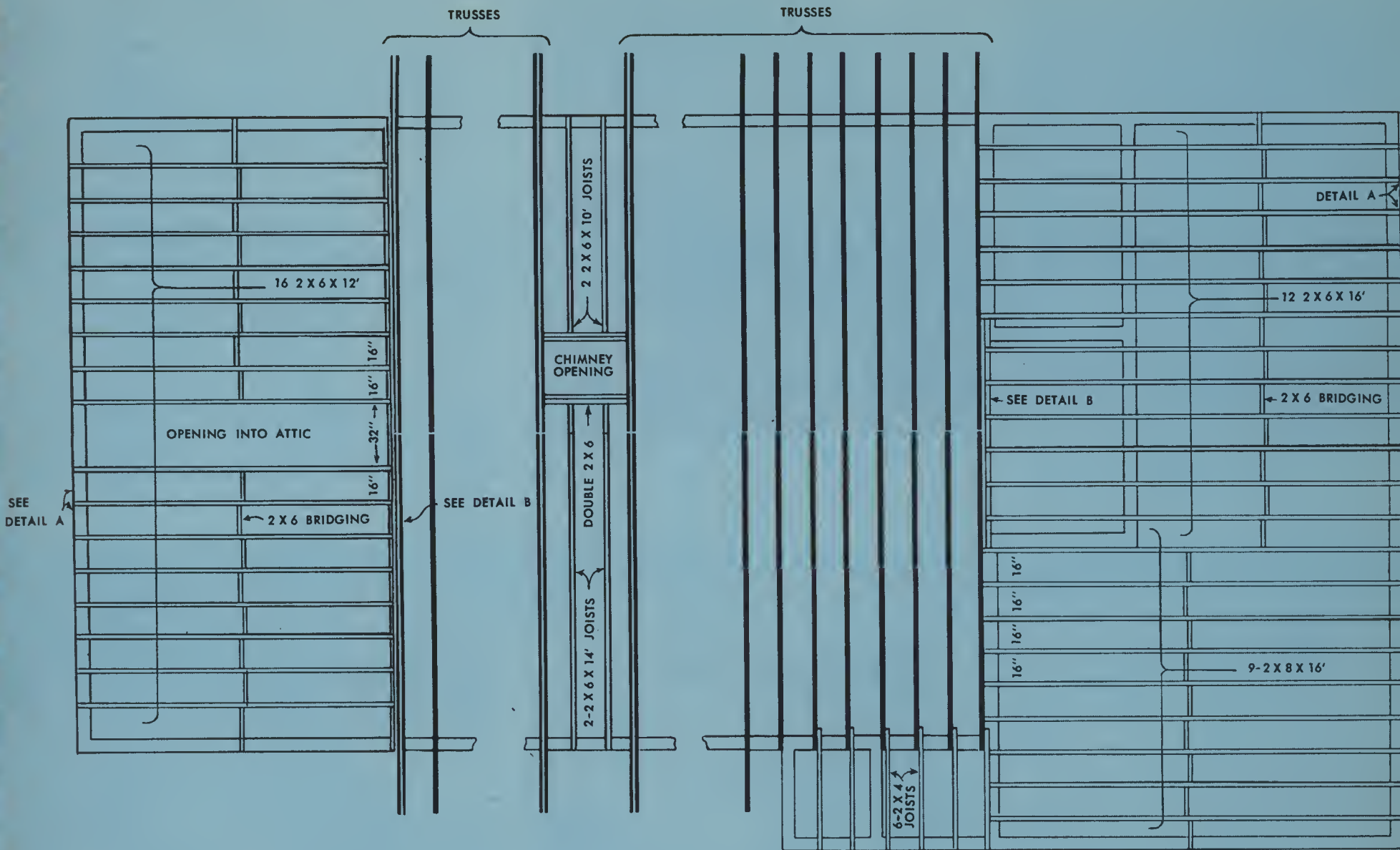
are placed. Just lay these on the soffit headers or window headers, whichever the case may be, at this time nailing them only to the trimmed ends of the rafters. The rough fascia frame of 2x4s is next fitted entirely around the house. Pick out straight 2x4s for this use and keep them in a straight line—the fascia will be a dominant feature of your house and will show up if not true. The 2x4s have considerable strength and will enable you to pull

any rafter with a slight warp up or down into alignment and to secure it there by nailing to the frame.

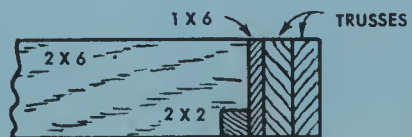
With all rafter and truss ends in alignment, you now toenail the 2x4 crosspieces to the wall headers, completing the overhang framing. Next, the finish 1x6 fascia board is nailed to the 2x4 fascia frame—this should be straight, clear lumber—and you are ready to start the roof sheathing.

ROOF SHEATHING

The first board of the roof sheathing is butted against the fascia board. Your roof sheathing will vary, depending on the type of shingles you use. For cedar or other wood shingles, the roof boards are 1x6 lumber spaced approximately $2\frac{1}{2}$ in. apart, so that air can circulate between them to keep the shingles from rotting. For composition shingles the roof boards



DETAIL A



DETAIL B

CEILING JOIST PLAN



First hip rafter placed at either end of the house is the common, or end rafter slanting down from ridge line. Shown here is the garage hip.

are 1x6 or 1x8 shiplap, nailed tightly together to cover the roof solidly, or you can use $\frac{3}{8}$ -in. plyscord sheathing here.

There's a simple way to space the roof boards for wood shingles. An 8d common or box nail, the size to use for securing the sheathing, is just the right length to use for a spacer. It is customary to not leave a space between the first two boards at the bottom and at the ridge line.

Lay the roof boards with their joints staggered, as on page 43, so that two or more joints do not fall on the same rafter directly above each other. Any boards that are warped can be forced in line with a large chisel or piece of 2x4 nailed to a rafter to act as a lever. If you have a skill-

saw, don't bother about sawing the boards to length at the ends of the roof—as shown on page 21 you can set your saw for a $\frac{3}{4}$ -in.-deep cut, snap a chalk line down the hips and saw them all at once to a true line.

If you plan to use metal gutters of the type that extend up under the shingles several inches—very good and simple to install—they should be placed now. These require no additional flashing. Wood gutters and the other type of metal gutter that is nailed to the side of the fascia board can be installed at any time later. With these, the strip of flashing shown on page 52 should be placed now, before shingling. It should extend down approximately 2

in. so that it can lap over the edge of the gutters when they are installed.

ROOFING

The roofing is a fast, easy job, and you have a choice of several good roofing materials today that will blend in well with the ranch house's architecture. Either wood or composition shingles—the most popular materials—are good and are reasonable in cost. Asbestos shingles or the interlocking aluminum shingles are very good, though these are considerably more expensive. A heavy grade of roll roofing, the cheapest, can be used, but this is not very attractive nor usually too durable. Because the trussed roof is strong, you can also use the new interlocking pumice or asbestos cement slabs that come 2 ft. or larger in size. Some of these are claimed by the manufacturers to be especially effective in giving extra insulation against the sun in hot climates.

Wood shingles are made today principally from western red cedar, cypress and redwood. Any of these three will give you a good roof, but only a No. 1

edge-grained shingle is recommended. It is definitely poor economy to use a cheap wood shingle. You may note that the list of materials includes the best No. 1 cedar shingles, which cost, if anything, slightly more than first-grade asphalt shingles.

With wood shingles, the first course is laid at the eaves and is doubled. The butts of this doubled course should extend $\frac{1}{2}$ to 1 in. beyond the roof boards to form a drip edge, and they should be on a straight line.

The recommended practice is to lay the following courses either 4 or $4\frac{1}{2}$ in. to the weather (4 in. is best but requires more shingles). You can purchase an in-

expensive gauge that clamps on a shingling hatchet for this, as shown on this page. Only two shingle nails should be used to secure each shingle, so the shingle can shrink and expand without cracking. These nails are placed about halfway up the shingle. The shingles of each course should break the joints with the course below, and nail heads should never be exposed at a joint.

Dry wood shingles are placed approximately $\frac{1}{4}$ in. apart so that they will not buckle when wet. If your shingles are wet, they can be laid close together. Some experts prefer to soak their shingles before laying, to eliminate having to space

them; others prefer dry shingles which are much lighter to carry up to the roof. This is a matter of choice; you will have a good roof either way. About every six courses up the roof, you should take the time to stretch a chalk line to true the courses. An ornamental treatment that blends well with the lengthy low lines of the ranch house can be obtained by doubling every sixth course of shingles.

Before shingling the valley on the front side of the house, tack down metal flashing the full length of the valley. Use a single piece of roll flashing, which can be galvanized iron, aluminum or copper and which should be 18 in. or greater in

Vinita Riley, taking over shingling job from husband, learns how to mouth shingle nails.

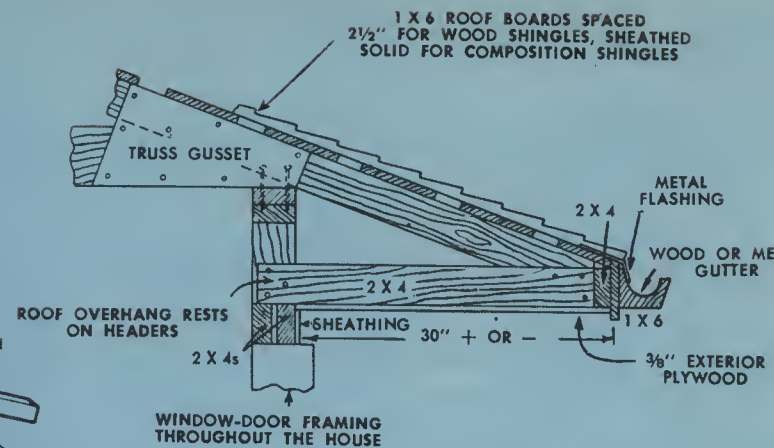
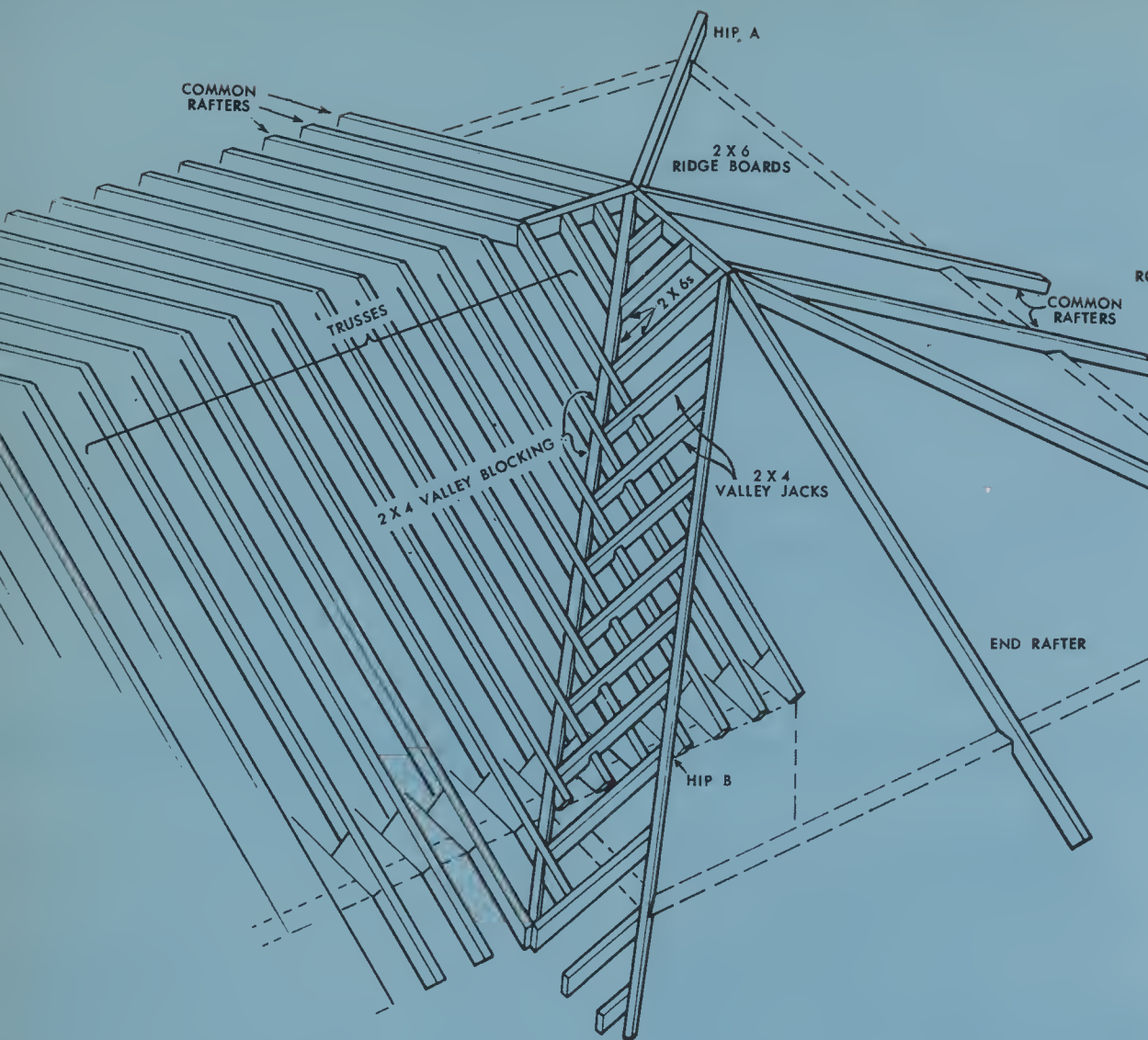


Small gauge on shingling hatchet helps place shingles from 4 in. to $4\frac{1}{2}$ in. to the weather.

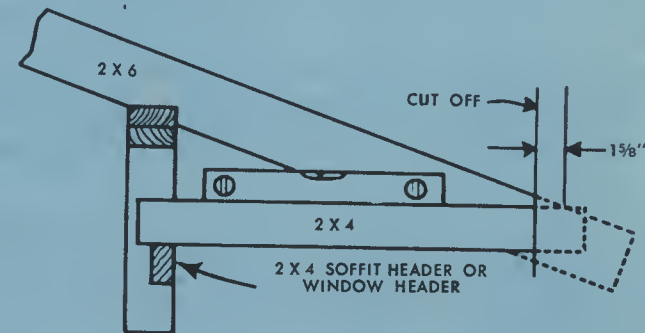


Although a stepladder can be used, a temporary scaffolding will ease the work on roof overhang.

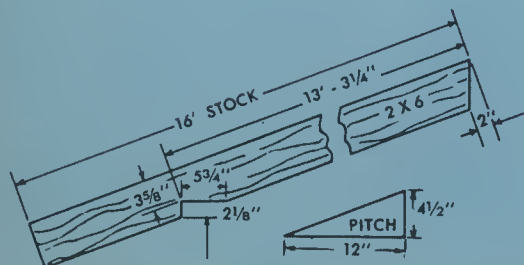




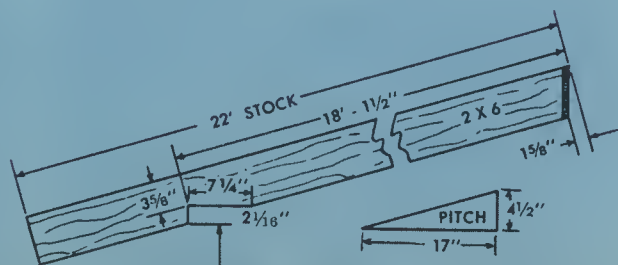
CROSS SECTION OF ROOF OVERHANG



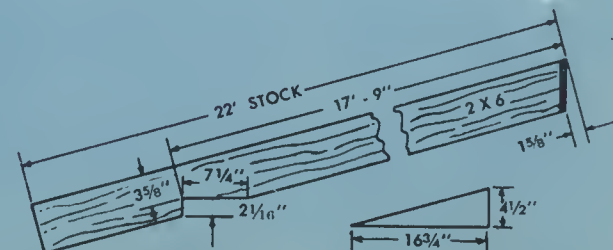
HOW OVERHANG IS TRIMMED



52 END AND COMMON RAFTERS



HIP RAFTER A



HIP RAFTER B

width. It is bent slightly to fit in the valley and is nailed only along the edges. The shingle courses do not lay completely across the valley but are trimmed back 2 in. from the middle or bottom of the valley on each side, so that a 4-in. width of the metal is left exposed. This allows water to drain off rapidly and, as it does not enclose the shingles, prevents rot. Do not drive nails through the edges of the shingles where they would puncture the flashing.

Openings for the vent pipes of the plumbing are not bothered with at this time. They are best cut through the roof later, when the exact location of each pipe is known. It makes little difference whether the chimney is built before or after the shingling. On the sides of the chimney opening, metal flashing is placed 4 or 5 in. underneath the shingles. This should be wide enough so that it can be bent 4 or 5 in. up on the sides of the finished chimney. This flashing is nailed to the roof only. Other pieces are let into the mortar joints of the brickwork when the chimney is made and are bent down over this shingle flashing to form a weather seal. The upper side of the chimney can be flashed in the same manner, except that here one large piece of flashing must be

used that is wide enough to extend 10 or 12-in. up under the shingles and 4 to 6-in. up to the side of the chimney. Or here you can purchase a ready-made chimney saddle from a tinshop—these perform the same job and have a sloped ridge so that snow will not pile up behind the chimney. On the bottom side of the chimney a roof flashing is placed on top of the shingles instead of underneath and is counterflashed as elsewhere by other flashing bent down over it from the brickwork. Therefore, this bottom piece can be placed when building the chimney.

The ridge line and the hips may be capped with metal ridge rolls made for the purpose or with an extra row of shingles laid parallel to the ridge or hip. For the latter, a chalk line is snapped along each side of the hip about 5 in. down. The extra row of shingles is started at the bottom of the hip, working up on both sides at the same time and keeping the lower edge of each shingle on the chalked line. Alternately, the shingle from one side is lapped over the opposite, and the excess is trimmed off at the top with a sharp shingling hatchet or draw knife.

Wood shingles may be stained before laying by dipping two thirds of their length in a tub of shingle stain. Or they

can be stained anytime afterwards with a large shingle brush. If you prefer the natural gray tone of weathered shingles—often attractive on ranch houses—several good colorless shingle preservatives are available today on the market. A good oil or creosote stain or the colorless wood preservative is recommended to lengthen the life of your shingles, but ordinary paint should be avoided because it may cause the shingles to warp and is quite unsightly if it should start to peel.

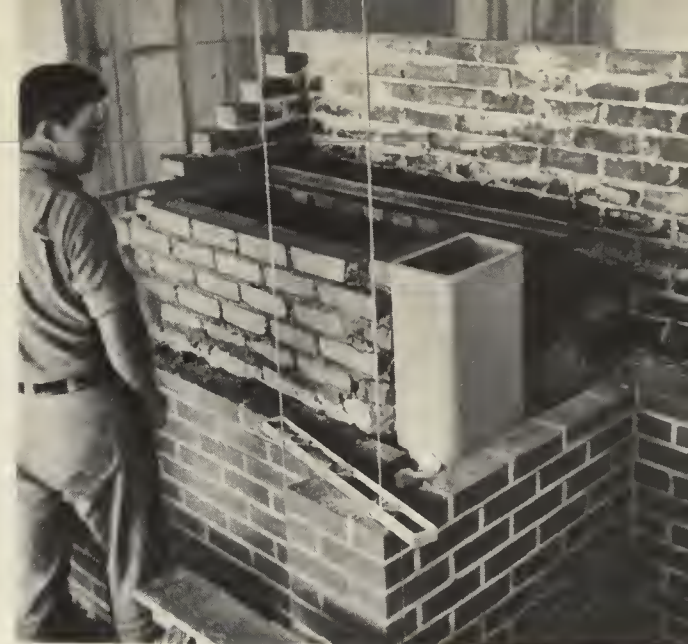
Asphalt shingles are available in many colors and types today, and each should be laid exactly according to the manufacturers' directions. Most are of the "self-aligning" type, which is the easiest to lay and keep aligned. Before any asphalt shingles are laid, the roof is covered first with an underlay of roofing felt. This comes in rolls 36 in. wide and is an asphalt-saturated felt weighing approximately 15 pounds per 100 sq. ft. Cut the felt to length beforehand and apply the strips vertically (from ridge to eaves), driving a nail here and there to hold them. Also, all types of asphalt shingles should be strengthened at the eaves by an undercourse (single row) of wood shingles. The undercourse should extend beyond the roof boards 1/2 to 1 in. to form a drip edge.



Here is the 28-in. high island-wall fireplace, almost as simple to build as a plain brick wall.



Brickwork rises to an inch below ceiling joists. Fieldstone hearth is like jigsaw puzzle in stone.



Angle-iron braces form fireplace throat. Flue liner shown is for furnace. Chalk line at corners.

You should avoid laying asphalt shingles on a hot day because your walking over them is likely to scuff and mark the softened shingles badly. As the principal damage to asphalt shingles is caused by the action of strong winds on shingles nailed too high, be certain that you follow the manufacturers' recommendations for nailing the particular shingle you have chosen. The flashing with asphalt shingles is the same except at the valley where you can substitute roll roofing of the same color and type as the shingles. This asphalt valley flashing should be doubled—the bottom strip 12-in. in width, the top strip 18-in. The ridge and hips may be

capped with the metal ridge rolls or with a 10 in. strip of the roll roofing, bent in the middle to straddle the ridge. Do not be concerned if some of the asphalt shingles do not lie flat at first. They will soften in the sun and lay themselves in time.

With any of the special roofings—the aluminum shingles, cement slabs and the like—you should carefully follow the manufacturers' directions for the specific type you have chosen. Here, the ridge capping, too, will vary with the roofing being used.

ISLAND-WALL FIREPLACE

Now that the roof is completed, you

have arrived at an important milestone in the construction of your new home—it is sheltered! If wet weather is on hand, it might be a good stunt to stop right here and install the windows and exterior doors to fully enclose the house. Otherwise, it is probably best to construct the fireplace first, so that door frames will not be scuffed by brick or wheelbarrows.

As already described, this "island-wall" fireplace rises through the opening in the floor like an island and on up to the ceiling. The fireplace and the 7-ft. length of brick wall that rises alongside give you inexpensively a kitchen-living room partition of masonry. Only the flue or chim-

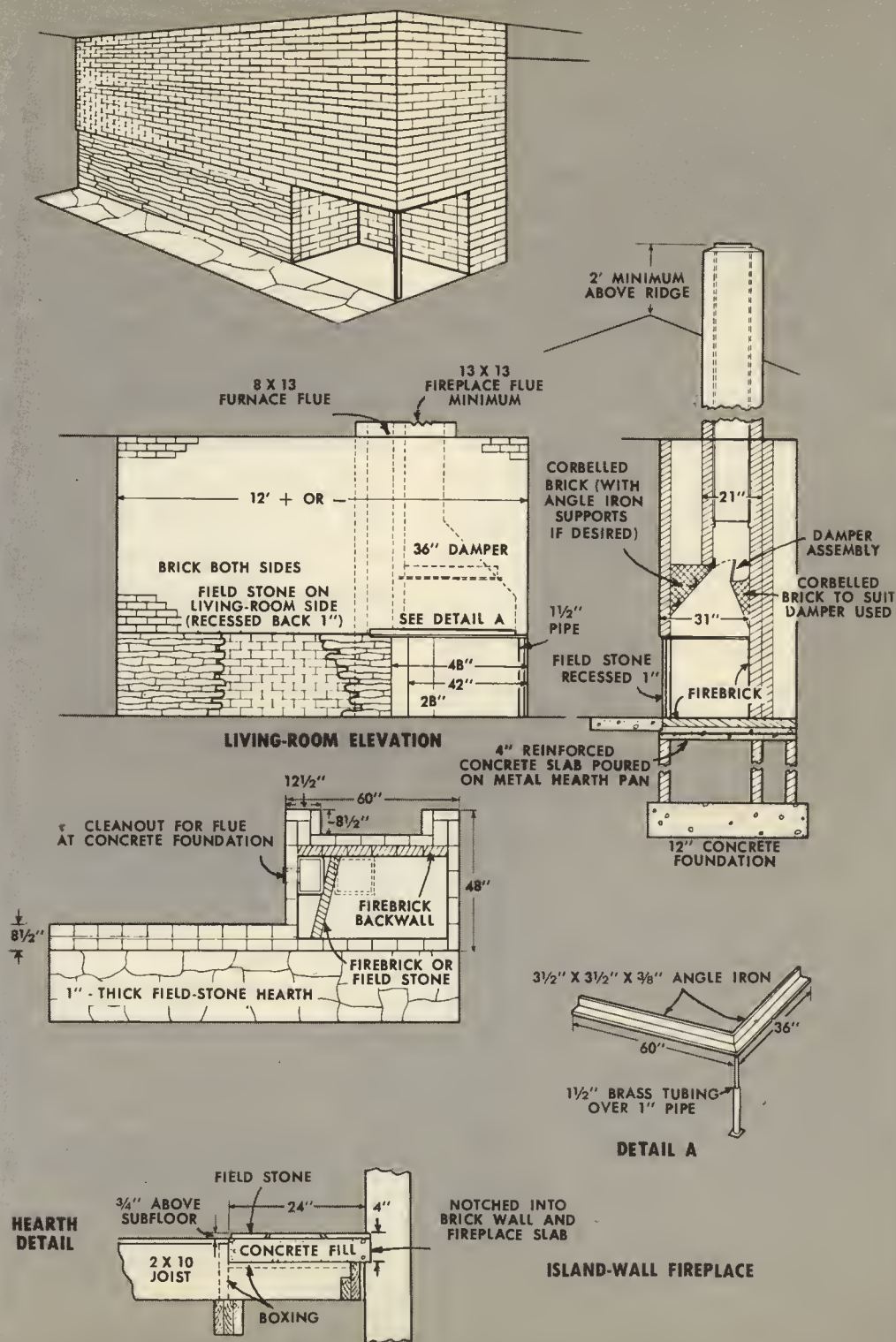
ney extends through the ceiling joists and on up through the roof.

In most cases, you probably will have the fireplace built by a skilled mason, because this is the one job in the ranch house where some experience is needed; but if you have had any experience at all with masonry work, you can build it yourself and save approximately \$300.

This Swedish or corner fireplace is actually the simplest type to build. Throughout the masonry is laid more like a foundation wall than anything, the firewall is not curved and nowhere does the brickwork have to be recessed among paneling or mantels. Even if you have never seen a brick before, you can lay the hearth yourself, because this is only a matter of fitting thin flat stones together on a concrete slab.

You will need approximately 1500 finish or face brick, 1500 common brick, 100 firebrick and approximately one ton of Arizona or similar fieldstone. If you prefer to use a split brick or Roman brick instead of the standard-size finish brick, enough additional should be ordered to equal 1500 standard brick.

You should order about two thirds of the fieldstone in pieces that are approximately the width and height of common



brick. These are commonly available and in length will vary from 6 in. to 2 ft. or so. They will be used in the recessed part of the living room wall. The other one third of the fieldstone is ordered in flat pieces approximately 1 in. thick to use as hearthstones. As everyone has his own taste in the colors—there are a multitude of pastel shades in fieldstone—and as the hearth requires juggling various pieces until they fit together, many dealers who handle stone will let you take a larger quantity than you need and return what isn't used.

First, you should decide on the hearth, so that its opening can be cut out at this time. As shown in these plans the 24-in. hearth extends the full length of the masonry wall. This hearth is modern in style and is recommended because its long lines tend to lengthen the expanse of masonry in the room. If you prefer a more conventional hearth, it can be stopped at the end of the fireplace opening or a foot beyond. Along the length of hearth chosen, the subflooring is removed 24 in. back from the hole already in the floor. The 2x10 floor joists that are thus exposed below are chopped down 4 in. and boxed in for a concrete fill as shown in the hearth detail. This boxing can be made of any

scrap lumber and may be quite rough, but it should be sturdy.

Next, courses of common brick are laid on the concrete footing of the crawl space to build up the masonry to approximately floor level. Note in the hearth detail that the 7-ft. length of masonry wall is two bricks' thick with the two courses approximately $\frac{1}{2}$ to 1 in. apart. Mason's tie strips (small strips of corrugated tin) are occasionally let in the mortar on both sides to help secure the two walls. Note also that a metal cleanout door is placed among the first course of brick, approximately underneath the furnace flue.

These foundation courses of rough brick follow the perimeter of the floor opening, and you will note in the side elevation view of the hearth that an extra wall is also built up across the 60-in. width of the fireplace opening 31 in. back from the front to form an extra support underneath the chimney.

The rough-brick courses are stopped about 4 in. below the subfloor along the 7-ft. length of wall. Courses of fieldstone "brick" will start here, and as the fieldstone is recessed back an inch, a ledge will be left here to help support the concrete slab of the hearth. At the fireplace, the rough brick is stopped approximately 7

in. below the subfloor to leave room for a reinforced fireplace slab. The simplest way to build this slab is to obtain one of the metal hearth pans made for the purpose. Four inches of concrete, reinforced with rods or heavy wire netting, is poured directly on the pan. So that ashes can fall into the ash pit underneath, an opening should be left in the pan directly below the furnace flue.

Finish brick is now used to continue the walls 28 in. up into the rooms. It's a good idea to string a vertical chalk line from each corner of the masonry to the ceiling above so that your walls will be plumb. Note that the wall on the breakfast-nook side of the fireplace jogs back the width of a brick from the slab up, to leave a recess for a cabinet. On the living-room side, the wall is bricked up to this 28-in. height with the fieldstone. The stone is recessed back, is placed snug against the brickwork of the kitchen side. The best effect with the stone is usually obtained by not completely filling out the mortar joints between stones. Keep the mortar $\frac{1}{2}$ -in. back from the surface. If a piece of stone juts out here and there, do not be concerned. A rough finish here is most attractive.

The finish firebrick of the fireplace floor

is placed in mortar on a level with the sub-floor. Your island wall will now resemble the first photo on page 54. Next, the firebrick back wall is built up, the first section of the furnace-flue lining is mortared in, and the slanting side wall of the fireplace is built. This sidewall can be either fieldstone or firebrick. After it is in place, you should fill in around the section of furnace-flue lining with scraps of brick and mortar.

The angle iron support shown in Detail A of the hearth plans is now placed across the fireplace opening and is mortared in with new courses of finish brick. The angle iron can be made up by any blacksmith shop. Note that the courses of brick

Breezeway floor is screened with 2x4 straight-edge slid between 2x4 leveled with floor.

on the living-room wall are now again placed $\frac{1}{2}$ to 1 in. out from the brick of the kitchen side. Thus, they will extend beyond the fieldstone, giving it a recessed effect.

As the finish-brick courses are continued on up toward the ceiling, the fireplace smoke chamber and throat is built inside the rectangle of the walls. As shown in the photos and in the hearth detail, the slanting brickwork is easiest built up with angle-iron braces. These angle irons extend completely across and rest in the walls on both sides of the fireplace. The exact size of throat for your fireplace will depend on the damper assembly that is available.

It is best to stop the walls 1 in. below the ceiling rafters. The chimney, four

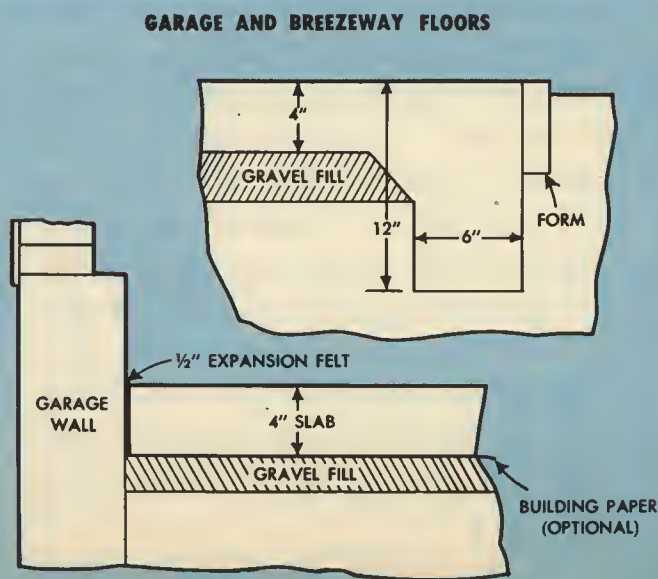
common bricks wide and $2\frac{1}{2}$ -in. thick, should rise through the joists and roof opening with a 2-in. fireplace left on all sides. Note that the 13 x 13 in. fireplace flue liner is started above the damper by resting the first section on a slight jog in the brickwork. Do not use a flue liner here that is smaller than 13 x 13 in.

Common brick is used for the chimney up to the roof, then finish brick is used to complete it. At the roof level, metal flashing is inserted in the mortar joints as explained in the shingling detail. Note that the chimney rises a full 2 ft. above the ridge of the roof to prevent drafts.

The hearth is the final step. The rough

Unless you have help, lay only half of garage floor at a time so you can smooth before it sets.

57



hearth form that you have already built is now filled with concrete up to approximately 1 in. below the subfloor. When this has set, a sand-and-cement grout is troweled over it, and the flat slabs of fieldstone are set in the grout. The fieldstone should rise approximately $\frac{3}{4}$ -in. above the subfloor. The only trick here is to fit the pieces together so that large voids are not left at the corners. You can chip rough spots off the pieces with a hammer, or, as shown on page 20, you can cut the pieces to fit by scoring them on the back side with a flexible cut-off disk and tapping them with a hammer.

This whole job is more of a jigsaw

The fixed panes of the larger windows are back-puttied and secured by wood stops on outside.



puzzle than anything, and the object is not to obtain as smooth a fit as with tile. The pieces should have $\frac{1}{2}$ to $\frac{3}{4}$ -in. joints that are fairly even and should be pushed down in the grout to give a fairly even floor. On the side opening of the fireplace, a border of the fieldstone, approximately 6 in. wide, is laid directly over the firebrick floor. Fitted around the corner post, this covers the bottom plate of the post and also serves as an ash stop here.

If you would prefer a raised hearth on your corner fireplace, simply lay two or three courses of common brick on the reinforced slab before laying the firebrick floor. The firebrick, in this case, should be faced on the outside edges with fieldstone.

GARAGE AND BREEZEWAY FLOORS

The concrete floors of both garage and breezeway should be poured about this time—after the roof is shingled to have protection from sun and rain. Both are 4-in. slabs laid on a cinder or gravel fill.

Even though these are not heated floors, it is a good stunt to place a layer of 15-lb. asphalt-felt or kraft paper between the concrete and gravel fill. This will help eliminate damp floors in wintertime, and, while you are pouring the slab, it will

prevent the water in the mix from draining rapidly into the ground and thus setting the concrete before you can smooth it.

Approximately 6 cu. yds. of ready-mixed concrete in a 1-2-4 mix are needed for the floors. At both the rear of the breezeway and at the entrance of the garage, a 12-in.-deep trench is dug to give additional thickness to the end of the slab. In cold climates this trench should be dug to frost line, if this is deeper than 12 in.

The breezeway can be poured all at once. First, a 2-in. form is staked across the rear opening, as shown in the drawing, and strips of $\frac{1}{2}$ -in. expansion felt are placed along the foundation walls. Next, 2x4s are leveled over the gravel fill with their upper edges at the desired height of the finished floor—so that a straightedge can be dragged over them to level or “float” the floor. Or you can raise the 2x4s on stakes so that their bottom edges are at the finish height. As shown in the photo, a 2x4 nailed to a strip of wood is then “floated” between them. This latter method is desirable because the 2x4s must be removed when the floor is leveled and this way do not leave large holes to fill and level.

After leveling, the floor is allowed to set slightly and is then smoothed with a wood

float. This floating will work the gravel down and leave a smooth cement-and-sand surface. Pull out your 2x4s at this time and fill any holes with fresh concrete. Finally, when the surface is fairly hard, it is gone over with a steel trowel.

The finished breezeway floor should be $\frac{1}{2}$ in. to 1 in. below the top of the house foundation wall and is best sloped slightly to the rear.

The garage slab is poured in the same manner, and it should be sloped a full inch or two toward the garage door. Note in the detail that this slab is placed several inches below the top of the foundation walls. It is not easy to get a smooth finish if you are inexperienced—and this finishing is hard work—so, if you are working alone, pour only half the garage floor on one day. This will give you a chance to float and smooth the surface before it hardens. Let the concrete cure for two or three days before walking on it and if the weather is dry cover it with wet canvas or burlap.

WINDOW AND DOOR FRAMES

All the window and exterior-door frames of the ranch house are built of clear 2x6 lumber right on the job. You will find that it is little more trouble to



Metal flashing strips, placed in saw kerf of window frame, give permanent weatherstripping.

build these frames than to assemble ordinary knocked-down frames, especially those of double-hung windows. As already mentioned, you will need a table saw. Any decent 8-in. saw will do. The cost of the most expensive will be more than saved by running your own frames, and you will also have the saw for the interior cabinetwork.

The door frames can be first. The simple frame for the front and rear doors is given in the drawing on page 61. You will need two similar frames for the garage and mud-room doors, these are 2 ft. 6 in. wide instead of 3 ft. The side members of each



Flush exterior door, cut in middle, provides handy Dutch door for entrance to utility room.

frame are mortised $\frac{1}{2}$ in. into the top member, and the nailing is done with 16d casing nails. For a tight joint, set the frame members in white lead as they are put together. Note in the detail that a saw kerf, a $\frac{1}{4}$ -in. deep saw groove for flashing, is run on the outside of the frame with your table saw. As shown, this saw kerf is placed the width of the 2x4 studs plus sheathing from the inside edge of the door frame (4 in. with plyscord sheathing). When your door frames are in place, a 2-in. strip of metal flashing is pushed into the saw kerf on all sides of the frame and is tacked down to the sheathing to per-

manently weatherstrip the frame. This is an improvement over past practice; the joint will be weathertight under any condition of shrinkage or settlement of the house through the years to come.

When setting the door frames in their opening, plumb them by driving thin wedges, such as pieces of shingles, behind them. A temporary spreader can be placed across the bottom to keep the lower ends of the frame in place. Note that the inside edge of the 2x6 frame is placed flush with the inside edge of the 2x4s of the wall. This is another departure from past practice that will greatly simplify your trim work later on. It is done on all door and window frames throughout the house.

You can now—or later, when finishing the flooring—install a 6-in.-wide oak threshold at the front and rear doors. The threshold is cut to fit across the bottom of the door frame. Later a 1/2-in. doorstop is butted down against it. Set the thresholds in seam compound. The garage and mud-room doors require no thresholds because they rest on concrete.

All window frames in the house are weatherstripped in the same manner as the doors—by flashing and a saw kerf—excepting the bottom members of the louvered windows, which rest directly on

the subfloor and are sealed with seam compound.

The window detail on page 61 shows you how to build the living room and den louvered frames. All vertical 2x6 members are mortised 1/2 in. into the top and bottom members, and the window sills are mortised 1/2 in. into the vertical 2x6s. You should carefully measure your rough window openings here and build the four-section living room frame and the three-section den frame to fit—a 1/2 in. or so smaller than the openings so that they can be slid in place easily. As with the door frames, these frames are plumbed and wedged before nailing.

The louvers are simple boxes with slanting louver boards glued and nailed inside. Built separately, they are slid into the lower openings after the frames are in place. Note in the detail that the louver boxes are kept approximately 1 1/2 in. back from the inside, so that space is left for screening, weatherstripping and the 3/4-in. door.

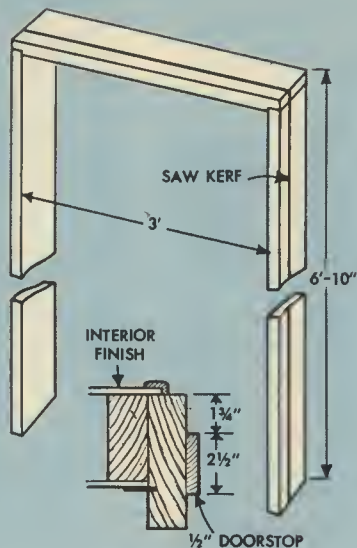
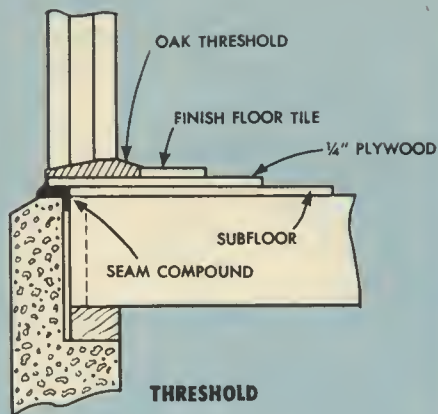
To complete the louvers on the inside, screening is first tacked to the inside face of the louver box. Protected from injury and requiring only a small amount of material, this screen should be bronze or copper so that it can be left permanently

in place for the life of the house. Strips of 1/2 x 3/4 in. wood are next nailed around the edges of the screen to secure it. Then a sponge-rubber weatherstripping, of the Innerseal type, is tacked over the wood strips entirely around the opening. If you are building in a warm climate, this rubber weatherstripping can be eliminated. Last, the 3/4-in. plywood baseboard is attached by screws to the louver box. You can assemble the above with the louver box either in the frame or out.

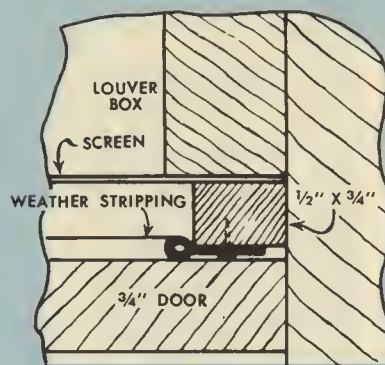
Three hinges should be used on the 3/4-in. louver doors and the chain stop is best made of the pull chain used on light fixtures. Doubled through small screw eyes, this can be adjusted to any length by the small connector that comes with it. The louver doors should be fit loosely, so that a 25-cent piece can be slid around the joints.

The bedroom louvered windows are built in exactly the same manner as the living-room windows, except that in the bedrooms the louver boxes are built to "vanity" height, 10 in. higher. They require a 27-in. opening instead of 17 in.

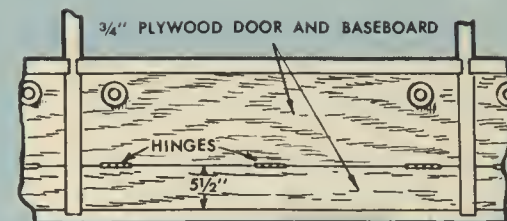
The dining-room windows and garage windows are framed the same way except that here the windows are simple rectangles without louvers below.



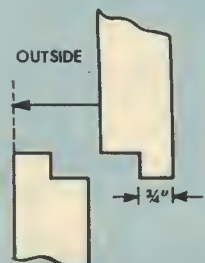
EXTERIOR-DOOR FRAME



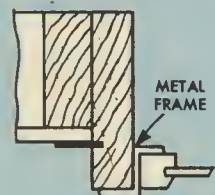
LOUVER-BOX CROSS SECTION



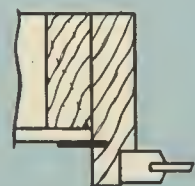
INTERIOR VIEW



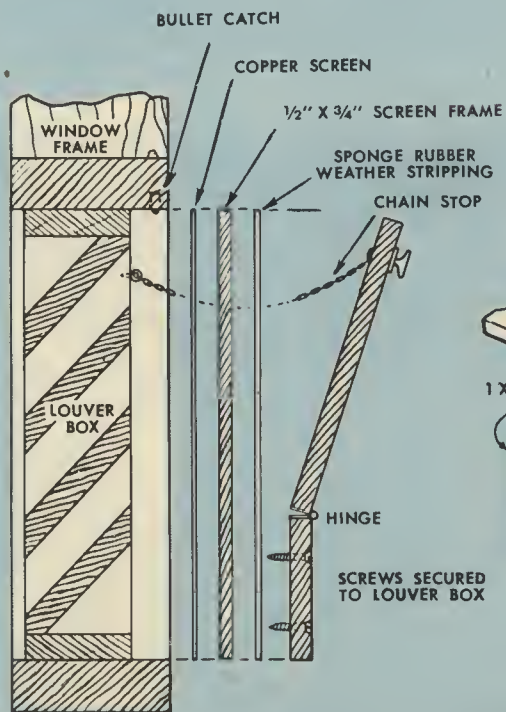
DUTCH-DOOR JOINT



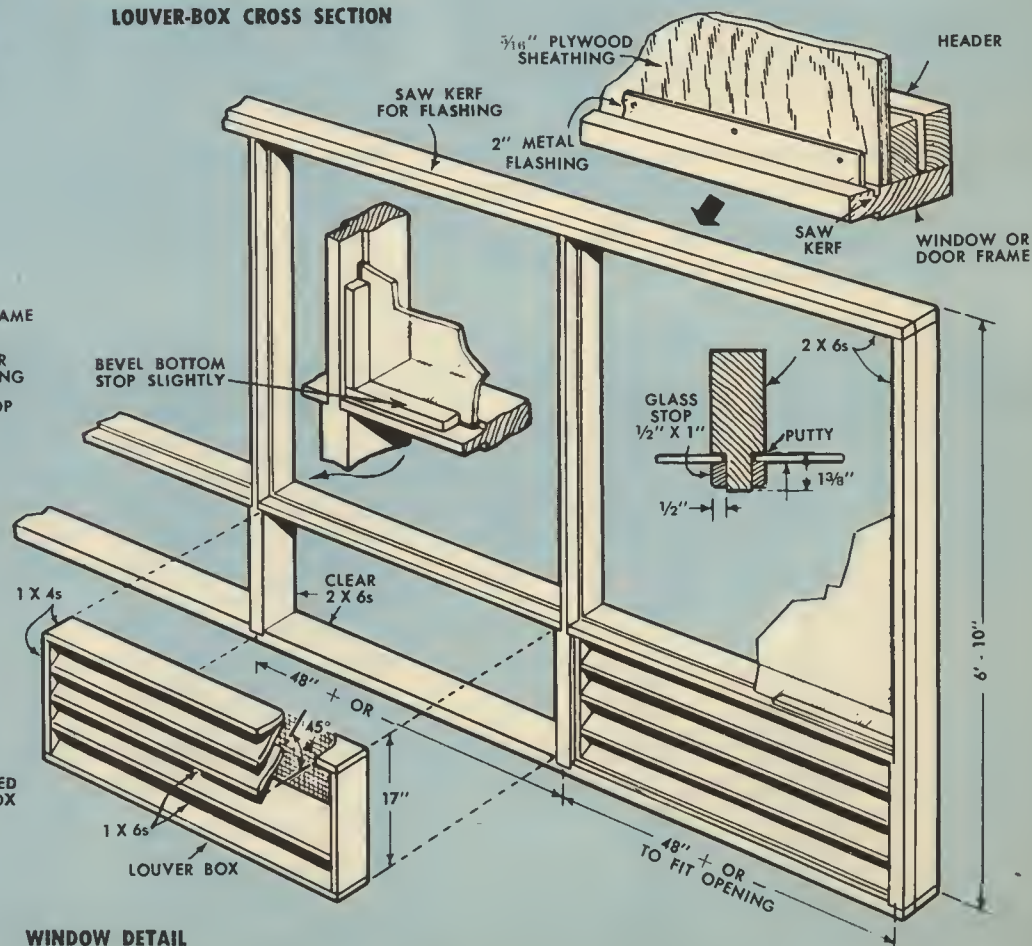
METAL CASEMENT WINDOWS



CLERESTORY WINDOWS



LOUVER BOX



WINDOW DETAIL



Here is how the living-room windows of the ranch house will appear when they are finished.

By studying the elevation views, you will see that all of the windows mentioned above are fixed panes. Therefore their frames are built to the size of the wall opening and then glass is cut to fit the frame. The following smaller windows of the ranch house are hinged or sashed windows that open. With these, it is best to obtain the sash first—usually with the glass already in place—and to build their 2x6 frames to fit the sash, to prevent any mistakes. You then block and wedge the frames to fit in the rough wall openings.

The clerestory windows of the two bedrooms require seven single panes set in



Windowpanes are held in place and trimmed with a glass cutter, using frame as guide.

2-in. or 3-in. wood sash. The sash size to order is 28 x 42 in. These open out from the bottom and are best hinged with 12-in. Whitco-type hinges on the upper sides. These are an inexpensive friction type of hinge that will hold the window open at any position. You need not hinge all of these clerestory windows unless you are building in a very warm climate. It is best to hinge at least one window, the farthest from the louvers, and the other panes can be set in white lead or seam compound and nailed in place. As shown in the detail, the frames for the clerestory windows have the same $\frac{1}{2}$ x $1\frac{3}{8}$ -in. rabbet as the fixed windows. The bathroom



Vinita Riley prepares living-room louver doors for painting. Note the three hinges necessary.

window is built the same as the clerestory windows. Sash size is 24 x 24 in. Here a pair of 10-in. Whitco-type hinges is satisfactory.

The windows for the kitchen and utility room are two 40 x $38\frac{3}{8}$ -in two-pane metal casements with both panes opening. This is a standard size available from local dealers and the mail order houses.

GLAZING

For all fixed windows of the house, $\frac{3}{16}$ -in. crystal glass is recommended. This is a good, heavy glass, yet nowhere near as expensive as plate or the thermo

type. For the garage fixed windows, $\frac{1}{8}$ -in. double-strength glass is sufficient.

You can glaze these fixed panes yourself. The best and simplest method of cutting the glass is to cut it right on the window frame as experts do. As shown on page 62, one man places a pane of glass in the bottom and snug to one side of the frame and then holds the whole pane tightly against the frame. Another person runs an ordinary glass cutter free-hand across the top and down the other side to trim off the excess glass. The window frame underneath the excess glass

gives a guide line to trim it evenly. The second man taps the glass gently along the cut—from the back side of the glass—with the handle of the cutter, then simply snaps off the excess with his hands.

Thus no mistakes result in cutting to size. You can start with the garage windows and this actually isn't as tricky as it seems. Each window frame should be "backputtied" before installing the glass. Glazing compound (a soft putty) is placed on the ledge behind the glass, and the pane is pressed firmly into this bed of putty until the compound oozes around the edges. Trick here is to soften the putty with mineral spirits. The $\frac{1}{2}$ x 1 in. glass stop is then nailed down without any more

putty on the outer side. The bottom stop of each window should be cut or planed to a slight bevel so that water will drain off the surface.

If you desire to double-pane these larger windows, a narrow wood or rubber stop can be used to separate the two panes and then a $\frac{1}{2}$ x $\frac{1}{2}$ in. wood stop is placed on the outside.

HANGING EXTERIOR DOORS

For the beginner, it is easier to hang a door on its hinges first, then to place the $\frac{1}{2}$ x $2\frac{1}{2}$ -in. wood stop on the frame to

Wide-lapped plywood siding is made by ripping 4x8 exterior-plywood sheets into 16-in. boards.

How the finished siding will look. The lapped siding is cheap, easy to apply and most durable.

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The edges of the lapped-plywood siding are painted with a mixture of white lead and oil.

the third hinge equidistant between these two. This method equalizes the door's weight on all hinges.

If you like Dutch doors, the rear door of the house is an excellent spot for one, being sheltered from driving rain and where it will allow you to quickly dissipate the steam of laundry units. The best way to obtain a modern Dutch door is to purchase a flush exterior door (the smooth solid-cored type). You cut it in half 42 in. up from the bottom and then reverse the ends so that the rough-cut ends will be at the top and bottom of the finished door. The joint at the middle is then rabbeted out. The doorknob is placed on the lower half and a bolt is placed on the

upper half to lock the two halves together.

It is a good idea to hang the garage door now—to fully enclose the garage for a workshop. Any standard 16-ft. overhead door can be used, of either the hinged-sections or solid type. It is framed with 2x6 stock as are the other doors, the frame extending down to the top of the concrete foundation as shown in the elevation views.

FINISH SIDING AND SOFFIT

The soffit or underside of the roof overhang is placed prior to the finish siding. As shown in the drawings, the soffit finish is $\frac{3}{8}$ -in. exterior plywood (plyshield). Or you can use a rough-grained plyweave or striated plywood which will hide all joints. Finish lumber (t&g) can also be used, but

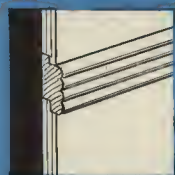
fit evenly against the door. On your front and rear exterior doors, three hinges should be used—the top hinge about 5 in. down from the top of the door, bottom hinge 10 in. up from the bottom and

64

JOINT SUGGESTIONS FOR EXTERIOR PLYWOOD SIDING



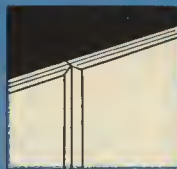
MOLDED BATTEN



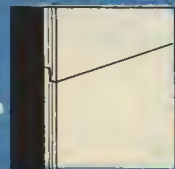
SHIPLAPPED MOLDING



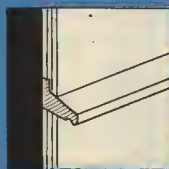
METAL FLASHING



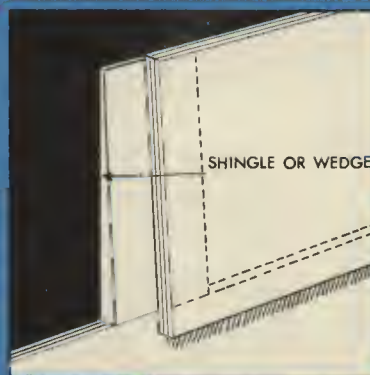
V-JOINT



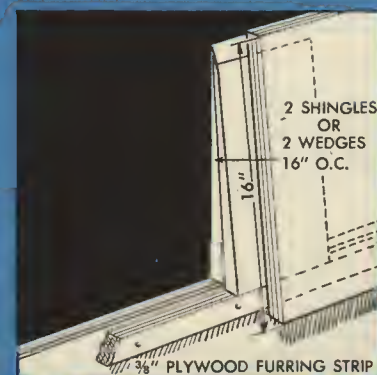
SHIPLAPPED



WOOD WATER TABLE



LAPSING



LAPSING, DEEP SHADOW

is subject to shrinkage and difficult to nail upside down.

When the soffit finish is up, five or six ventilating holes, approximately 6x12 in. in size, should be cut in it as shown in the floor plan. These will allow air movement in the attic and should be screened against insects. A good trick here is to purchase the cheapest of furnace warm-air registers and screw these over the holes. Having a damper, they can be closed in extremely cold weather.

The striking wide-lapped siding of the ranch house is the $\frac{3}{8}$ -in. plyshield applied horizontally as wide, lapped boards. This rather new plywood application is receiving wide attention throughout the country and is already fully approved by F.H.A. and other authorities. It has definite advantages, cutting to nearly half the current high cost of lapped siding, eliminating the splitting and warping of today's common siding, and architecturally adding length and lowness to any ranch-house design. Also, this method gives a second air space in the wall and allows the wall to "breathe," thus reducing the problem of peeling paint.

The wide "boards" are obtained by simply ripping standard 4x8 panels of $\frac{3}{8}$ -in. plyshield into 16-in. wide strips with your

table saw. Each panel makes three boards. Recommended practice is to set the saw blade at a 25 to 30 degree angle when making the cuts, so that the exposed edge of the installed siding will have a bevel to provide a drip line.

Six of these boards are lapped up the exterior walls and are secured with galvanized 6d casing or box nails. The lap should be approximately 1 $\frac{1}{2}$ inches. First, a $\frac{3}{4}$ -in. wood strip or cant is nailed entirely around the house at the bottom of the sheathing. This is done to flare out the first row of siding so that rain will not drip down behind the concrete. Seam compound or a 2-in. strip of metal flashing should also be placed here to weather-seal the joint between the sheathing and concrete.

A $\frac{3}{8}$ x 1-in.-thick spacer strip of wood or plywood is placed between the boards at each lap. You can leave out this strip and lap the plywood boards directly, but the strip is recommended as it gives a deep and pleasant shadow line to the wide siding. It is $\frac{3}{8}$ in. thick because common shingles are $\frac{3}{8}$ in. at the butt and pieces of shingle are placed behind the siding at each wall stud. During or before application, the edges and lapped joints of the plywood boards are painted with a rich



For wide-lapped joint, strips of shingle are placed on stud lines under plywood boards. A $\frac{3}{8}$ -in. strip of wood goes at the bottom to give an attractively wide shadow line to finished wall.

mixture of white lead and oil. At the corners, the boards are finished in the usual manner with wood corner molding, metal corner strips or by mitering and gluing the plywood.

The drawings show several other methods of installing plywood siding. Lumber yards stock various metal and wood moldings for horizontal application of plywood without lapping. On 16-in. centers, these will give a finish similar to the lapped siding. The vertical batten joint is another good method that is particularly easy to install. The plywood is placed full width

with vertical battens over it on 16-in. centers to give the smooth board-and-batten effect illustrated on page 16.

You can, of course, use other finish sidings on the ranch house. Plywood or shiplap sheathing allows you to use clapboards, drop siding, shakes, vertical boards, stucco and the like. Composition sheathing, as already mentioned, is recommended only for long boards applied horizontally. With plywood siding placed over plywood sheathing, no building paper is needed between the layers. Otherwise, building paper should be tacked or stapled to the walls before applying your siding.

BREEZEWAY

The highly versatile breezeway can be finished several ways, depending on how it is to be used. For a breezeway or sheltered outdoor area, it should be finished with an exterior siding. If you are enclosing part of it for an extra room, that part can be finished as the other interior walls of the house.

A treatment that serves excellently for both purposes has been used in the test house. The lapped-plywood siding of the exterior of the house is continued around the rear corners into the breezeway and on to the house and garage door. Forward

of the doors the walls change to full 4x8 panels of $\frac{3}{8}$ -in. plyshield placed vertically with a shallow groove cut the full height of the panel every 16 in. with a skillsaw or router. This gives a very attractive vertical-board treatment that will not deteriorate on an exposed breezeway and that will also give attractive paneled walls for any room that is enclosed now or later on.

The breezeway ceiling is best finished as the soffit with $\frac{3}{8}$ -in. plyshield. Simply placing the 8-ft. lengths across the ceiling with beveled V-joints will give an attractive ceiling here.

INSULATION

Insulation is an item you can leave out, but it is quite inexpensive if done during

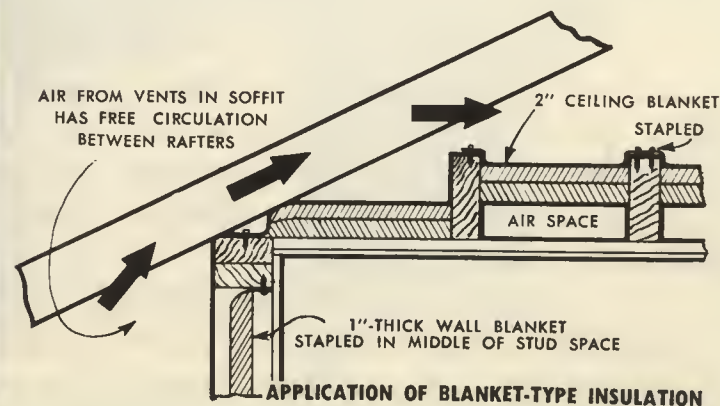
the construction, especially so if you do it yourself. And it is childishly easy to do at this time. The cost will be paid back in fuel savings in a very few years.

There are two general types of insulation that you can use today, the reflective or aluminum-foil type and the fill type (rock wool, glass wool, cotton, wood fiber, etc.). The claims for each are often very confusing. The latter type stops two causes of heat loss—heat transferred by direct contact or conduction and heat transferred by convection, by air inside the wall spaces being warmed on the inside surface, rising and moving to the outside surface, losing heat there and returning to repeat the process.

The aluminum-foil insulation mainly



Blanket insulation is tacked to sides, not edges of studs. This permits gluing of panels later.



stops heat loss by radiation—the way a fireplace transfers heat to your face. Installed in a wall space, it will reflect heat back inside in the winter and back outside in the summer.

Either type will do a good job. The fill type is most commonly used today. It also acts as a barrier against wind, dust and moisture. This rock wool, glass wool, etc., is available both in long blanket rolls and in stiff short bats. The blanket style is recommended for the ranch house, as it is the easiest to install in this construction. Highly recommended is the blanket style with aluminum foil attached to the back—giving the advantages of both types of insulation.

To install the insulation, an automatic stapling gun should be rented from your dealer. The rent of these guns is very low. You use them like a hammer to drive one staple after another—this speeds the work considerably and leaves one hand free to tuck the material as you go.

The blankets come in 16-in. widths for tucking between the studs. A drawing shows the best way to lay the blankets. On the side walls they are stapled in the middle of the stud space, on the ceilings to the top of the joists and the 2x6 truss members. This will give you an extra air



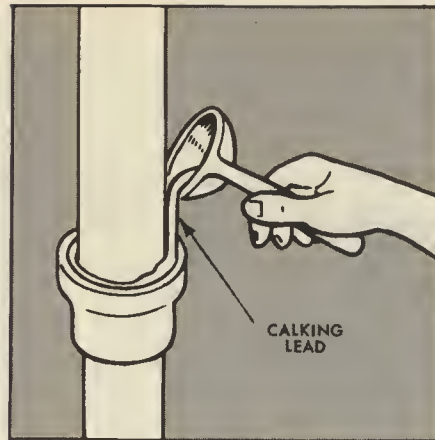
Above, Tom completes installation of Disposal in G. E. electric sink—dishwasher is at right. Below, hub-top tees in the vent lines eliminate need for large unions in this part of plumbing.

Above, lead can be melted in the fireplace for calking soil-pipe joints before installing them. Below, oil-tank vent, when connected with three ells, will not snap and break if oil tank settles.

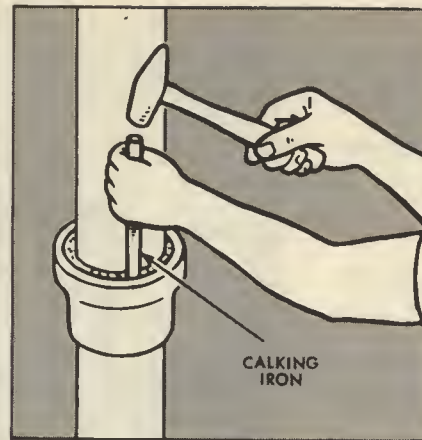
CALKING SOIL PIPE



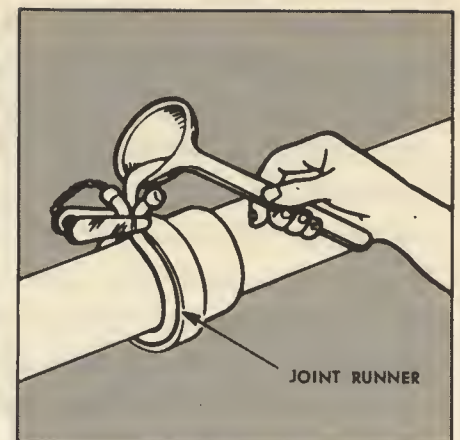
1st — PACK WITH OAKUM



2nd — FILL WITH LEAD



3rd — TAMP FIRMLY



FOR HORIZONTAL SECTIONS

space. Fill in all spaces above and below windows and doors and between all studs, even those quite close together.

The insulation has paper flanges along each side for stapling to the studs. In no case should these flanges be tacked to the inside edge of the 2x4 studs. This would prevent your gluing the finish-wall paneling to the studs later on—an important point in paneling. The blankets come in long rolls which can be cut to length easily with a knife, shears or fine-toothed saw. A 2-in. blanket is recommended for the ceiling insulation and a 1-in. blanket is usually sufficient for the walls.

If you wish, you can also enclose the walls of the bathroom with the 1-in. wall insulation. This will soundproof the plumbing and is a touch that costs only

a few dollars when you are doing it yourself.

PLUMBING

You are now into the part of house construction that contractors call the subtrades. The plumbing is a good-sized subtrade on which you can save a considerable sum in a week or two by doing the work yourself. First of all, you should check your local building codes to ascertain whether restrictions require that the plumbing be done by licensed workmen—licensed plumbers are required in many cities. If not, there is no reason you cannot do the plumbing yourself. The complete layout is given here, showing where every pipe and fitting goes; and the few complicated things of the trade, such as wiped-lead

joints, have been eliminated to make the job as simple as possible. Best of all, this plumbing plan gives you a complete layout for modern appliances. The system will adequately handle a Disposal, an automatic dishwasher and an automatic clothes washer—you can install these now or later without expense or alterations. It is advised that you check the plan with your city or county authorities, because the requirements covering the test house may not be the same in your locality. Some localities pose special sewage problems or have minor plumbing variations that should be put into the layout before you start.

For the job you will need a pipe vise, pipe dies (for threading $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$ and 2-in. pipe), two pipe wrenches, hacksaw,

cold chisel, ladle, calking iron, yarning iron, joint runner and a small pot or furnace for melting lead. You may be able to borrow most of these for the short time they are needed, or you can usually rent them from a hardware store. The pipe and fittings in the material list should be on hand. You should also have the bathroom fixtures available so that measurements can be taken directly from them.

First, you should understand that there are, in effect, three plumbing systems in any home—the waste lines, the vent lines and the service or water lines. Your waste lines are the heavy 4-in. cast-iron soil pipe and the 1½-in. and 2-in. lines, shown on page 71, leading up to the drains of the fixtures. These drain all fixtures in the house and their problem, if any, is clogging. On their horizontal lines, they should always have a downward grade of ¼ in. to 1 ft. They must have gentle horizontal turns, which are obtainable only with ells and tees of the type called long-turn waste fittings.

The 1½-in. and 4-in. vent lines that rise up the walls above the various fixtures are for what their name implies—venting the fixtures to bypass any sewage gas and to prevent trap siphoning. You see, you do not place a trap underneath the

kitchen sink just to catch the wife's wedding ring. The trap is there so that it will always contain enough water to block sewer gases from seeping up the lines and out the sink drain. The trap must be vented so that these gases can escape out the roof and so that a rush of water down the trap will not carry all with it, leaving the trap dry. As these vent lines do not carry liquid or waste, they can be made up of ordinary short-turn galvanized fittings.

The service lines are ¾-in. and ½-in. galvanized pipe. Their job is to carry the hot and cold water under city water pressure.

The waste lines are first and you can start by locating the hole for the closet-waste connection. How far out to cut this hole from the bathroom wall is determined by measuring the distance from the center of the closet trap to the back of the tank. Allow ½ in. extra for wall paneling when marking this on the floor. Cut out this hole with a keyhole saw to the size of the closet bend fitting, which is later placed in this hole from below and capped with a flange.

Next, the hole for the 4-in. vent stack is cut in the 6-in. bathroom wall behind the water closet. Then the 4-in. waste

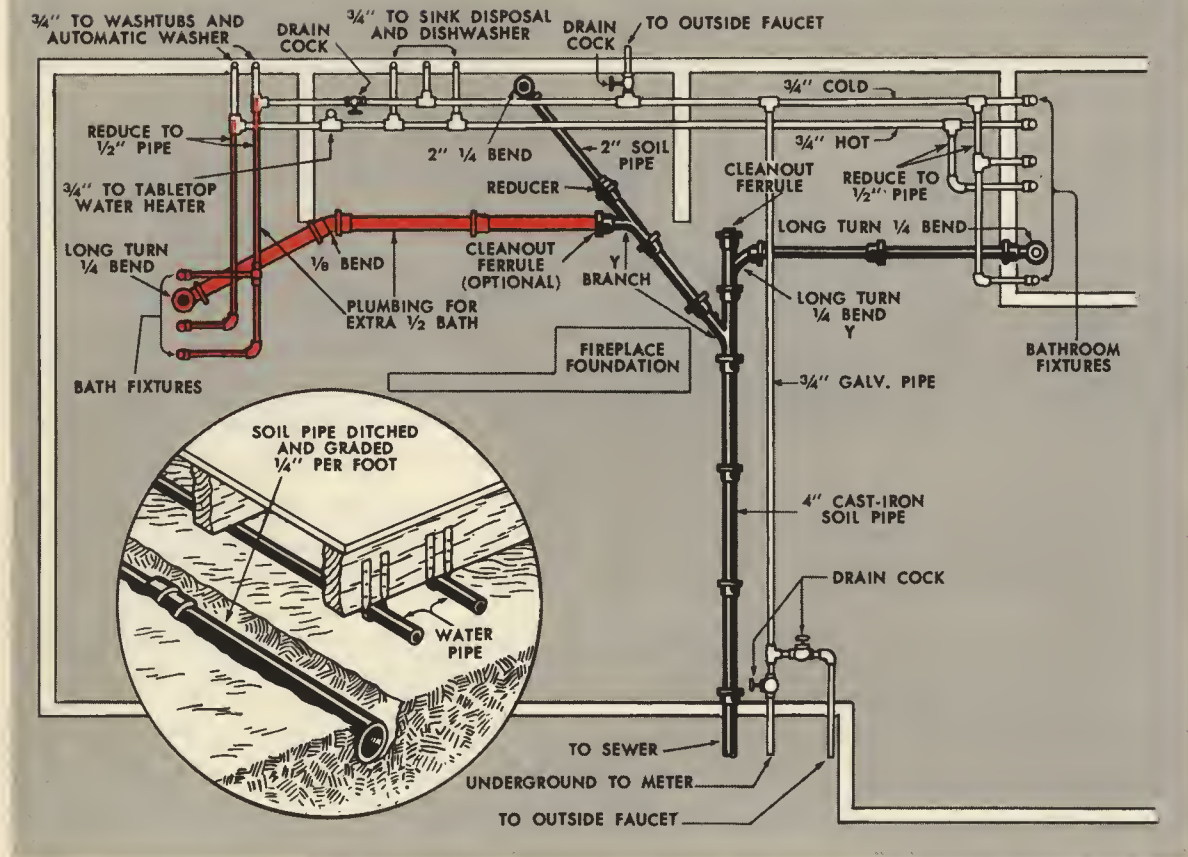
lines under the floor are fitted into place as shown to connect to your sewer. If your sewer connection is at the rear of the house, the main waste line and its two Ys are simply reversed to extend the line in that direction. The line can also extend out at either end of the house.

It is best to cut and assemble all pieces of a run of this soil pipe for a trial fit before calking them. To cut the soil pipe you first score it completely around its circumference at the desired break with a cold chisel and hammer. Then a few sharp taps with the hammer will break it off at the scored lines.

The beginner is usually concerned about calking this heavy pipe. It is actually quite simple, as shown in the drawing. The oakum is pounded into the joint until there is about an inch-deep space left for lead. The molten lead is poured into the remaining space with the ladle, and is then pounded down to assure a tight seal. You can melt the lead with a gasoline furnace made for the purpose or by simply placing a pot of it in a fire in your fireplace. Do not economize on the lead—about 4 lbs. is proper for each joint of 4-in. pipe; 2 lbs. for a 2-in. joint.

On horizontal runs of soil pipe, you will use the joint runner that is shown, a

CRAWL SPACE PLUMBING LAYOUT



short piece of asbestos rope that is clamped around the joint to form a dam for the molten lead. You can pour many of the horizontal joints—as plumbers often do—without the joint runner by calking fittings together in an upright position before placing them under the house.

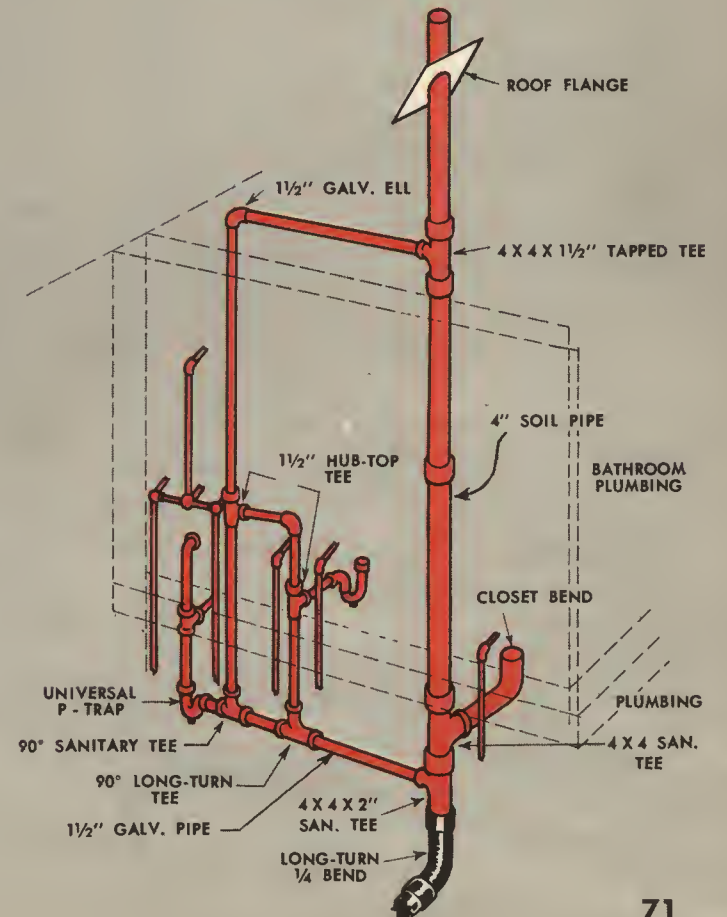
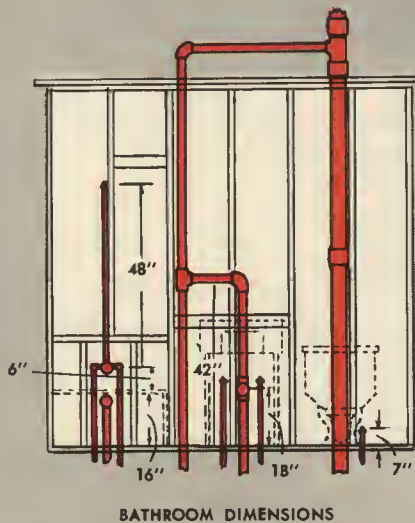
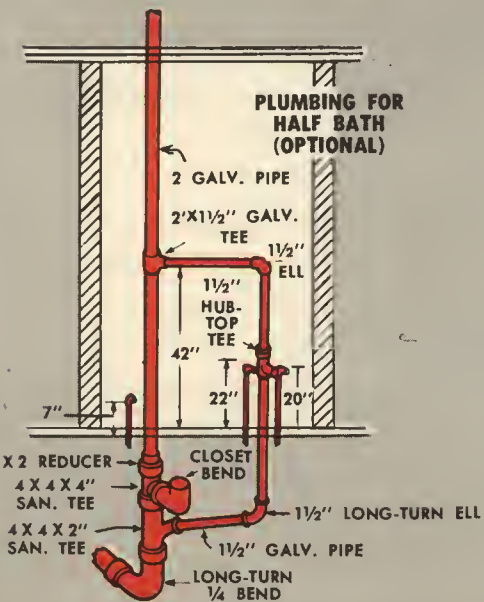
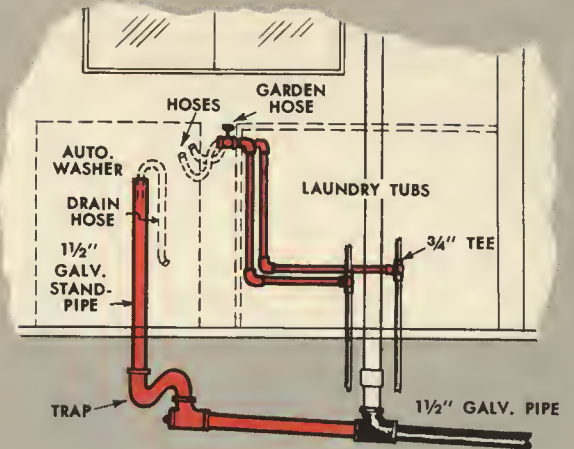
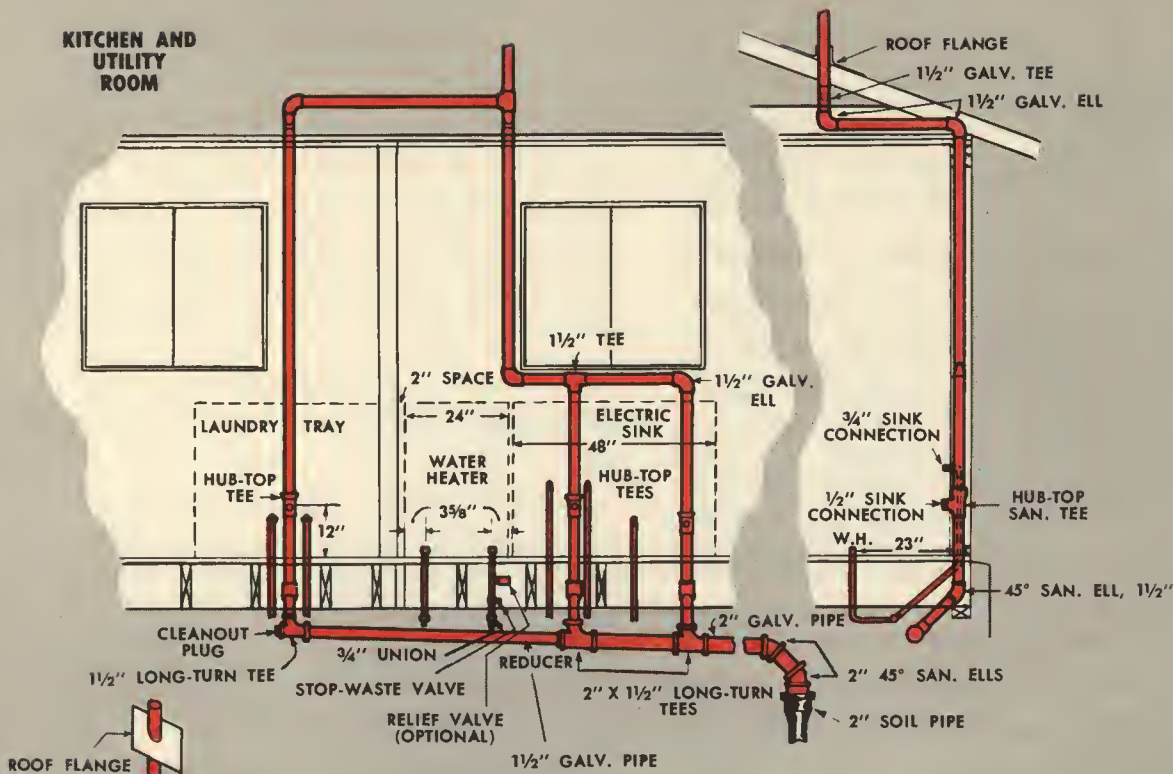
With the waste lines of the crawl space in place, you assemble the 4-in. vent stack

up through the roof. If you are building in a cold climate, you should install a fitting called increaser to this stack and to any other vent through the roof. The increaser is simply an extension of larger-diameter pipe that will prevent hoar frost from collecting in the exposed vent in zero weather and clogging it. A hole through the roof boards and shingles is cut to the

outer diameter of the 4-in. pipe. A standard 4-in. roof flange is worked into the shingles over the hole before placing the pipe. Most of these roof flanges have a lead rim around the opening which can be filled with seam compound and then hammered down to fit snugly against the pipe. The last section of pipe is slid through the flange from below. It should end at a minimum of 12 in. above the shingles.

Two holes should now be cut in the bottom of the 6-in. bathroom wall for the 1½-in. vent and the 1½-in. lavatory waste pipe. First assemble the waste lines below to ascertain exactly where these holes should be. Pipe compound or red-lead paste should be used on all threaded ends of this and other threaded pipe. A hole for the bathtub drain is more of a rough slot cut through the floor from the wall to the tub's drain opening. It is a slot to have space for the brass-tube assembly of tub drain and overflow drain. Measure your tub for this opening and cut it out roughly because the tub will cover it. The bathtub trap is best a two-piece "universal" cast-iron trap, rather than the one-piece trap. The universal trap has some give and take; therefore you can connect the tub without exact alignment.

KITCHEN AND UTILITY ROOM



Next, the 1½-in. vent pipes are continued up the bathroom wall and connected in the attic to the 4-in. stack. The horizontal run is placed above the ceiling joists. Note the two 1½-in. hub-top tees shown on page 71. These are a type of waste tee with threaded bottom and side openings. The top opening is belled so that it can be calked like the soil pipe, and thus eliminates the need of any unions in these heavy 1½-in. lines.

For the run to the kitchen and utility rooms, the soil pipe is reduced to 2-in. size. Note that the galvanized waste pipe emptying into this soil pipe is also 2-in. to underneath the kitchen sink, where it is reduced to 1½-in. pipe. This is needed for proper discharge of a Disposal and automatic dishwasher. The waste lines up through the wall are 1½-in. galvanized pipe, and two hub-top waste tees in the kitchen and one in the utility room are used for the trap connections. Note that the vent lines are offset back three or four feet above the ceiling so that both can be connected to one pipe through the roof.

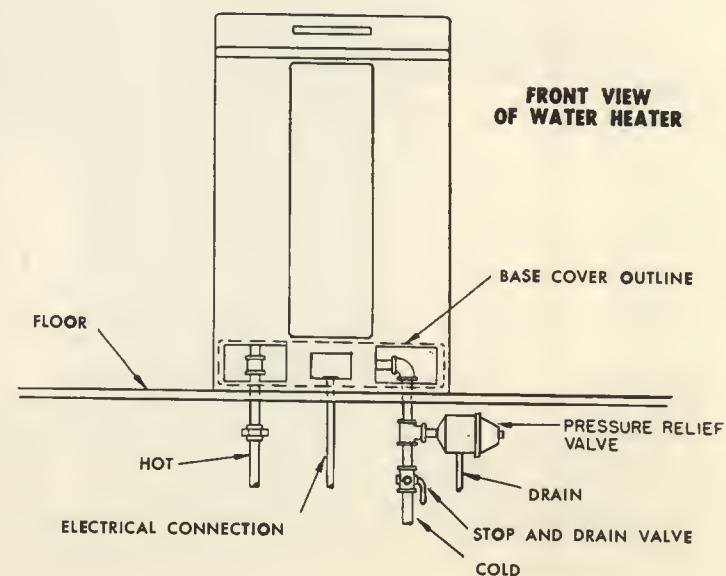
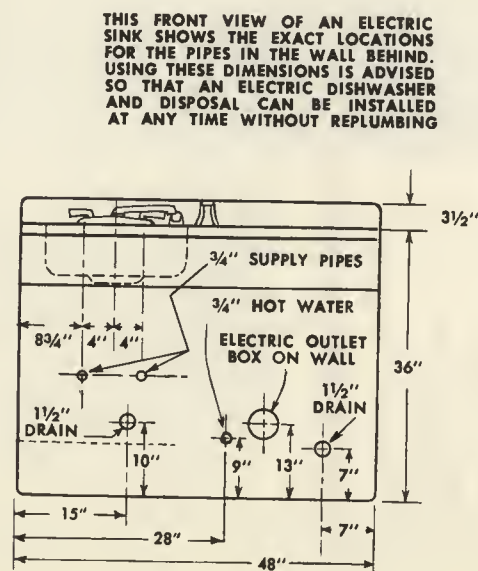
The remaining plumbing in the house is the service lines. Galvanized ¾-in. pipe is used throughout except on the short runs to the various bathroom fixtures—to insure good water supply through the

years. Pipe compound should be used on all threads, and each connection here must be extra tight because it will be under pressure. Detailed drawings show how high the lines for the fixtures and bathtub shower head should extend up the walls of the bathroom, and also the exact measurements of all pipes needed for a General Electric disposal, sink and automatic dishwasher (electric sink) in the kitchen. If you are using an ordinary 48-in. sink cabinet instead, the ¾-in. hot water outlet and 1½-in. drain on the right side are plugged.

The drawings show how a table-top water heater is plumbed into the kitchen corner. The pipes simply rise through

holes in the floor underneath the tank. The dimensions given fit the 40-gal. tank specified in the material list. Note that a 2-in. space is left between the tank and wall on the left side for finish paneling and a splash board. The pressure relief valve shown underneath the water tank is not always installed in home hot-water systems, but is good protection against tank damage and is required in many localities.

The water heater should be installed while plumbing—first placing a section of wall panel behind it—so that the hot water lines can be tested for leaks. The bathtub is also installed early, because the finish walls of the bathroom should butt



down against the tub, not be placed behind it. The other fixtures are not placed until the interior walls are completed—the porcelain fixtures, especially, are easily damaged. However, you should place ells and pipe plugs on the ends of the service lines and turn on the water pressure for a test.

Later, when the fixtures are installed, they are best connected to the water pipes with chromed-copper tubing which you can purchase in 6 ft. lengths and cut off as needed. This tubing, soft and pliable, can be bent to fit in close corners. It is connected to the fixtures and water pipes with slip nuts and rubber washers.

A drawing shows an alternate method of installing an automatic clothes washer. Usually, the automatic washer is connected by hot and cold hoses attached to garden valves set in the lines to the laundry tubs. The washer drain, a large rubber hose, simply hooks over the side of the laundry tub to discharge.

The alternate method is especially desirable when you are combining the utility room with the kitchen and wish all plumbing hidden. Here the drain hose is hidden and the faucets are at a convenient out-of-the-way spot on the side of the laundry-tub cabinet. The drain standpipe can

rise through the floor inside the cabinet of some washing machines, directly behind others. Note that a trap must be placed at the bottom of the standpipe.

OPTIONAL HALF-BATH

The optional half-bath at the rear of the house is a very handy and desirable feature that you should add if at all possible. Its materials—plumbing, fixtures, doors and partitions—will cost approximately \$150. Realtors will tell you that it adds \$500 to \$800 to the sales value of your new home.

Its crawl-space plumbing is shown in two drawings. Note that the vent stack is 2-in. galvanized pipe, not 4-in. soil pipe as used in the main bathroom. Only one 4-in. stack is needed in the house. Therefore, this plumbing-wall partition can be of 2x4s, rather than 2x6s. The hole in the floor for the water closet is located as in the main bathroom, leaving a ½-in. space for the finish wall. Any standard water closet and small lavatory can be used. The vertical section of vent pipe above the hub-top tee should be approximately 42 in. above the floor so that a small medicine cabinet can be placed in the wall above it.

If you are using an oil-burning furnace,

there is also a little plumbing and one trick in connecting up its oil tank. The tank should be buried in the ground outside the house, where its weight, when filled, will settle it somewhat in the ground. The settlement will not bother the fill pipe, which extends straight up to lawn level, nor the oil line to the furnace as that should be pliant ½-in. copper tubing. But you must also have a vent pipe, either 1¼ or 1½-in. galvanized pipe, usually running horizontally underground from the tank to the side of the house, where it extends up near the soffit to dissipate the fumes. The vent will break off somewhere near the tank when it settles unless you connect it with three ells as shown on page 67. These can turn and give under the pressure.

GUTTERS

If not already on, the gutters can be installed now—completing the exterior of the house. This is a simple job. Many types of metal gutters are available today that have simple bracket hangers, require no soldering and have ready-made corners and downspout fittings—no sheet-metal fabrication is necessary to install them.

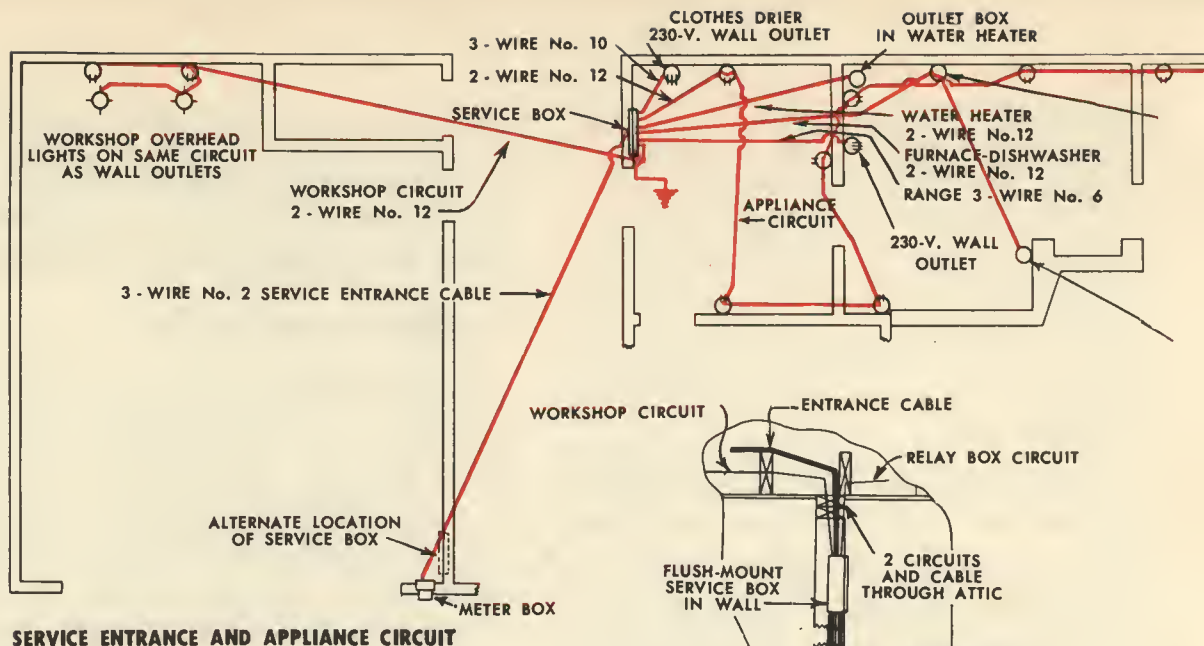
Wood gutters are also easy to install, being simply nailed or screwed to the

fascia board of the roof overhang. The joints on wood gutters should be mitered and white-leaded for a tight joint.

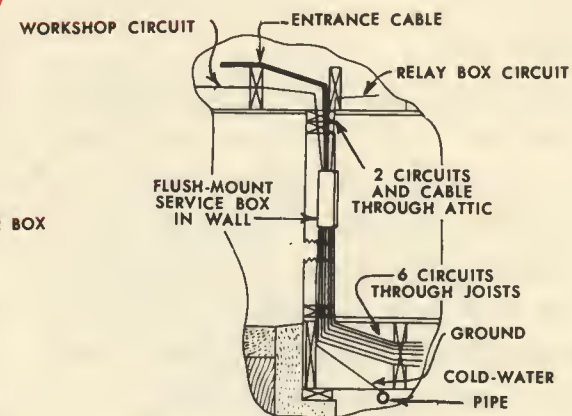
The downspout locations are shown on the house elevation views. These can be changed to fit the drainage system of your lot but should be kept fairly equidistant around the roof. The rectangular downspouts are preferable in appearance for the ranch house. A good trick on downspouts is, when cementing the lower end into a drain tile, to stuff paper around the downspout so that you pour only a ½-in. or so of concrete on top. This thin concrete cap can be broken out in the case you ever have a stoppage inside the drain. The drain tiles, whichever way they drain, should first lead a good 4 ft. away from the house to prevent water from trickling down alongside the foundation walls. If your local sewage system is designed to handle the extra storm water, the gutter drains can enter the sewer line somewhere outside the house. Otherwise, they should be connected to a dry well or cesspool.

WIRING

If you take a close look at the average house, you will find that the wiring—the wires, switches and lights—is left almost exactly as it was done 20-odd years ago.



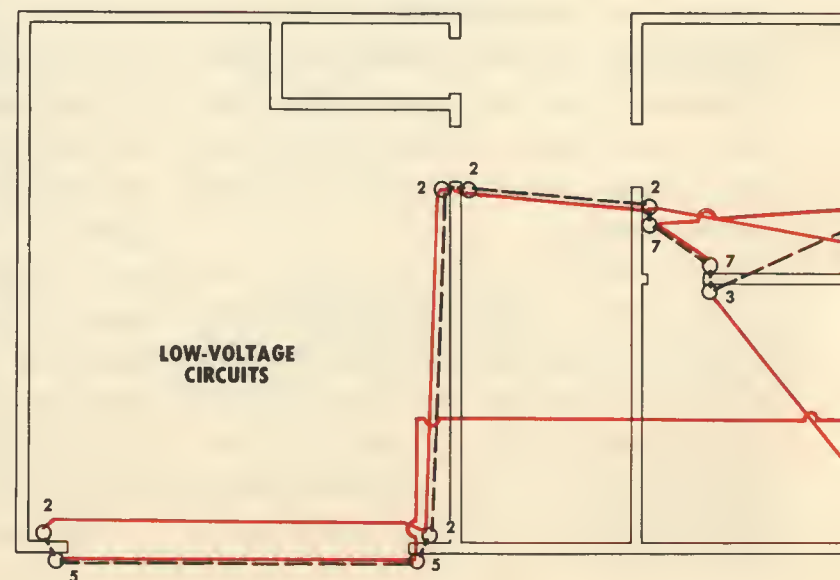
SERVICE ENTRANCE AND APPLIANCE CIRCUIT



SECTIONAL VIEW OF UTILITY-ROOM WALL

FUSING	
MAIN—	2-60 AMP.
RANGE	2-45 AMP.
CLOTHES DRIER	2-30 AMP.
WATER HEATER	2-20 AMP.
DISHWASHER & FURNACE	1-20 AMP.
WORKSHOP	1-20 AMP.
APPLIANCE	1-20 AMP.
LIGHTING CIRCUITS	2-15 AMP.

SERVICE BOX WITH THREE "PULL-OUTS" AND EIGHT STANDARD FUSES RECOMMENDED. (GIVES ONE EXTRA FUSE)

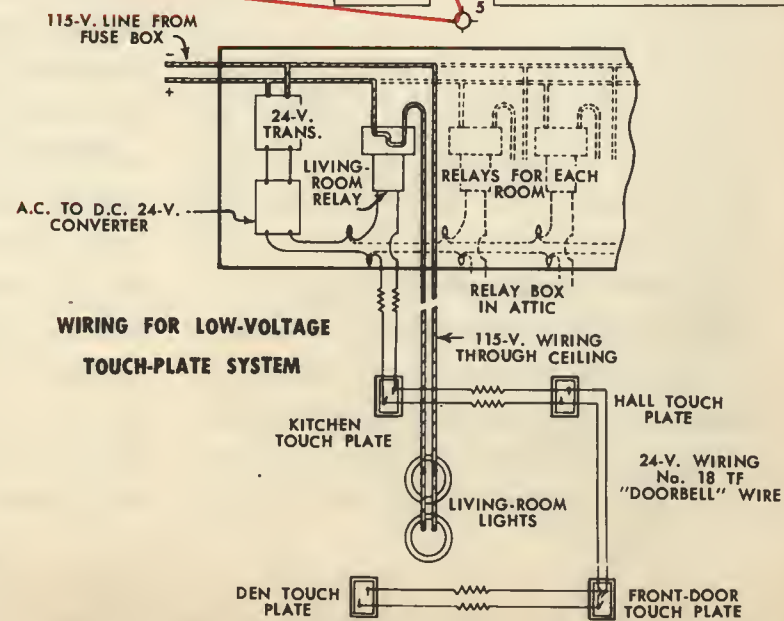
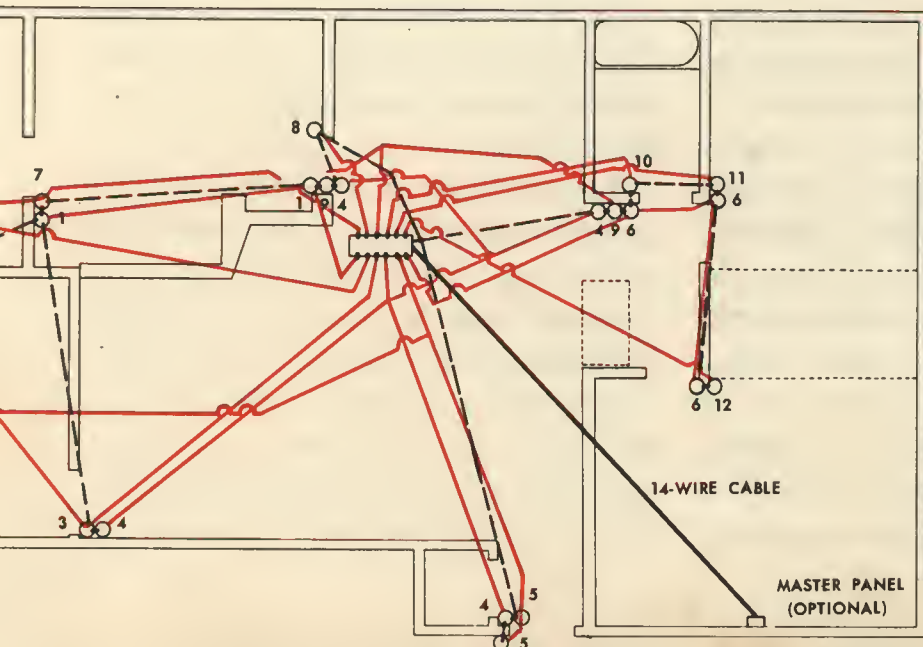
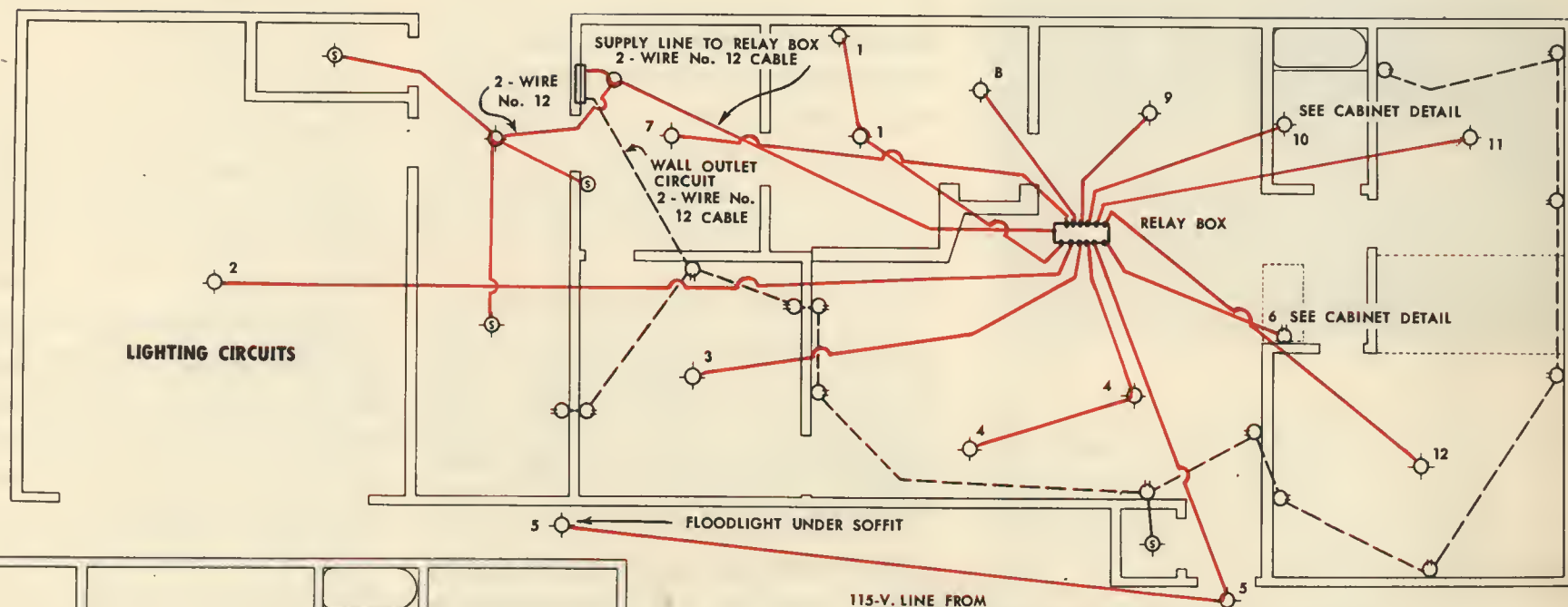


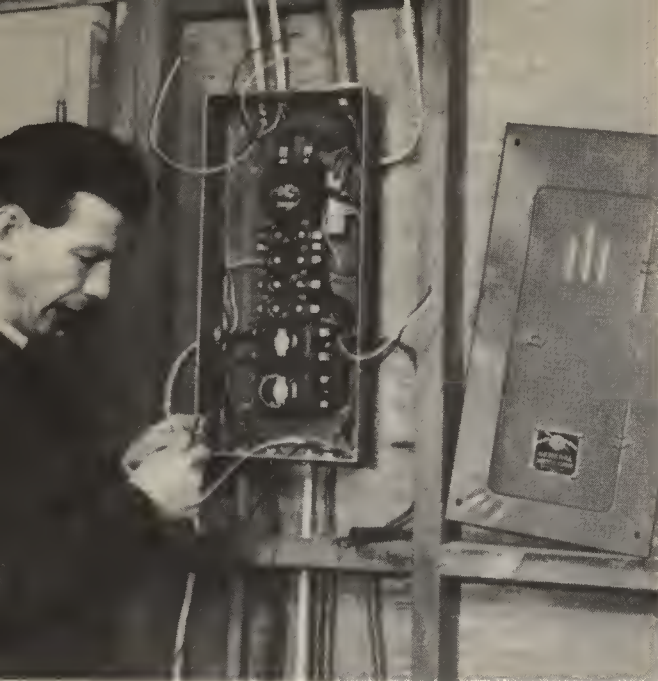


115-V. OUTLET BOX
ON FURNACE

SYMBOLS

- ⊗ 230-V. WALL OUTLET
- ⊙ 115-V. WALL OUTLET
- ⊙ CEILING LIGHT
- 4" ROUND OUTLET BOX WITH COVER
- ⊙ PULL-CHAIN CEILING LIGHT
- WALL SWITCH





Compact electrical entrance box contains three "pull outs" and eight ordinary fuses to handle an electric range, automatic washer, dishwasher.

This practice of minimum wiring is definitely not recommended today, especially with the many appliances a family now uses and with the truly adequate lighting that is now available at low cost. Here you are shown how to wire the ranch house so that it can utilize all electrical appliances at full efficiency, and you are shown how to install the new low-voltage lighting circuits, with which you can very inexpensively glamorize your entire home with modern, convenient lighting.

This wiring layout has been made exceedingly easy for anyone to do; but before starting the job you should check with your local authorities. As with plumbing, the codes sometimes require that the wir-

ing be done by a licensed electrician. If not, a city or state permit is usually required at the start of the wiring so that an inspection can be made of the job before the utility company wires in. Also, the electrical codes vary somewhat in different localities, requiring minor variations in the layout, which you should make at the start.

Right at the start, you will need to choose one of three different types of 115-volt wiring to use in the house. These are sheathed cable, armored cable and rigid conduit—and your local code may specify which one you can use.

The sheathed cable, also known as non-metallic cable, has two or three wires encased in a coated-fabric jacket, which is resistant to moisture and fire. It is smooth and flexible, and lends well to working through the walls and joists. Armored cable, also known as BX, is a similar cable except that it is encased in a flexible steel jacket. Rigid conduit is a metal tubing through which wires are pulled after it has been bent or formed to the desired shape. It is available either in thin-wall or rigid tubing and is the best for rugged

commercial installations but is the most expensive for a home. There is also a fourth type of wiring—the old-fashioned knob and tube—but this is not recommended because it is both tricky to install and easily damaged.

The sheathed cable has been used in the test house and is shown here. It is the least expensive, is durable (especially the newer types with plastic-insulated wire) and is the easiest to install—if permitted by your code.

The service entrance is a good place to start your wiring. This includes the service-entrance box (fuse box) and all wiring between it and the point on the roof where the power company taps in. Notice in the drawing that the service box can be placed either in the utility room or in the garage. The utility-room location is the most convenient in the case a fuse blows, but either is satisfactory.

You should use a service-entrance box similar to the one given in the material list and shown on this page. It has three "pullouts" and eight ordinary screw-in fuses, adequately fusing the entire house and giving you one spare circuit. You can substitute a service box with circuit breakers, which are an improvement on fuses, but a circuit breaker box of this size is

usually quite expensive. Whichever box you obtain will have its own wiring diagram inside to show the proper terminals to use in connecting up your circuits.

From the service box to the meter base, three-wire No. 2 service-entrance cable is used. This is a heavy, sheathed cable that is run up the wall above the service box, across the attic and down the garage wall to the meter box. It should be supported every 3 ft. or so by cable brackets and is best run along the side of ceiling joists where it will be protected. Ask your power company if there is any specific location desired for the meter box. Usually it should be at a 7-ft. height on the outside of the house. From the meter box, three No. 2 wires are run through 1½-in. rigid conduit up to the weatherhead where the power company attaches its lines.

The weatherhead should be on the roof, never on a side wall of a low ranch house. The power lines would thus be too close to your head level and the wires would be quite unsightly. The ½-in. conduit is run through the shingles directly above the meter in the same manner as a plumbing vent pipe. Its weatherhead is 2 or 3 ft. above the roof so that insulators can be clamped to it to secure the incoming power line. Ask the power company how high

to extend the conduit—this depends on the type of insulator they use, and you do not want it any higher than necessary because more bracing will be needed. The conduit must be anchored solidly to the house, and your three wires should extend about 1½ ft. through the weatherhead to give enough length for the connections.

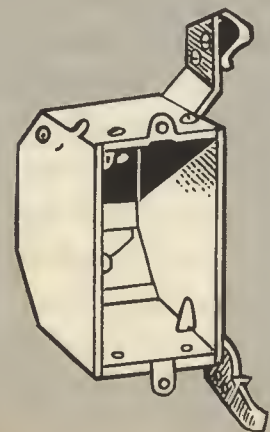
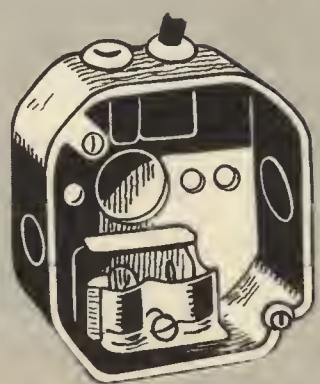
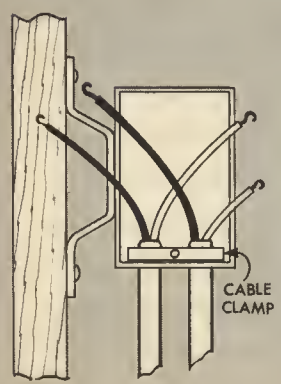
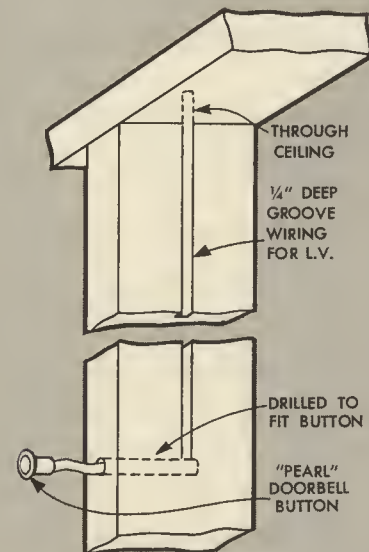
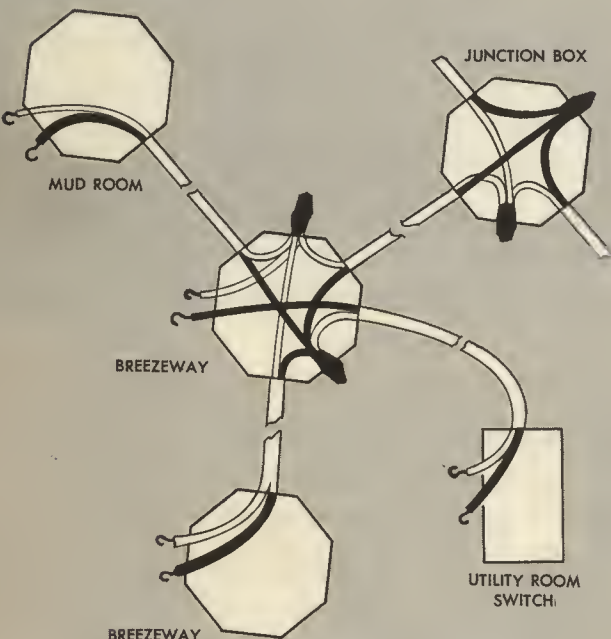
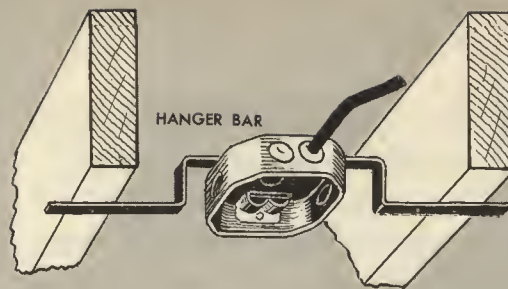
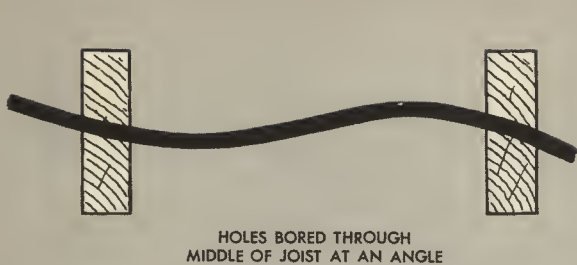
The service entrance is now completed. You will note that this is a three-wire entrance. Each of the two “hot” wires carry 115 volts and when connected together will give you 230-volt current. Each, when connected to the white or ground wire, will give 115-volt current. The diagram inside your particular service-entrance box shows you how to correctly connect the three wires so that each 115-volt circuit carries half the 115-volt load in the house.

A study of the wiring diagram will show you the layout of all appliance circuits. If, for instance, you are intending to use a gas range, the wiring to that appliance can be left out. But it is not advisable to reduce the service entrance for this reason. You would have to completely replace the service entrance if an electric range is desired later.

Note that all appliance circuits except the garage-workshop circuit extend down

the wall from the service box in the utility room and are run through holes drilled in the floor joists beneath. A wood bit chucked in a small power drill is handy here, but you can use a hand brace and bit. The range circuit is 18 ft. of 3-wire No. 6 service-entrance cable, run under the floor and up the kitchen wall to a range outlet box. The clothes-dryer circuit is 3-wire No. 10 sheathed cable, and it terminates at a second range-type outlet box on the wall. The water-heater circuit and furnace-dishwasher circuit are common 2-wire No. 12 sheathed cable. The garage-workshop circuit is 2-wire No. 12 sheathed cable run through the ceiling joists. Note that the workshop lights and wall receptacles are placed on the same circuit so that, if a fuse blows, the lights cannot go out and leave a saw running in the darkness. The ground wire for the service entrance is a single No. 6 wire (it can be bare) running down through the floor to a ground clamp on the nearest cold-water pipe.

The 2-wire No. 12 appliance circuit extending through the utility room, kitchen and dining room is one required today by nearly all codes. It takes a 20-amp. fuse and serves only the receptacle outlets in these rooms, where such items as ironers and



toasters are most likely to be attached. The locations in the walls for these and all other receptacle boxes are shown in the wall studding plans. Select the type of receptacle box shown at the lower right of detail. This has built-in cable clamps and brackets for easy nailing.

The final part of the wiring is the lighting circuits. Two are required for the house. As it requires little, if any, more wire, the wall receptacle outlets (all but those you have already placed on the ap-

Low-voltage wiring allows unobtrusive switching with doorbell buttons in such handy places as this in the glass partition alongside breakfast booth. Drawing at left shows this switch.



pliance circuits) are kept on one lighting circuit and the room ceiling lights on another. This equalizes the load and if a fuse should blow, either lamps or the ceiling lights will remain on in the rooms.

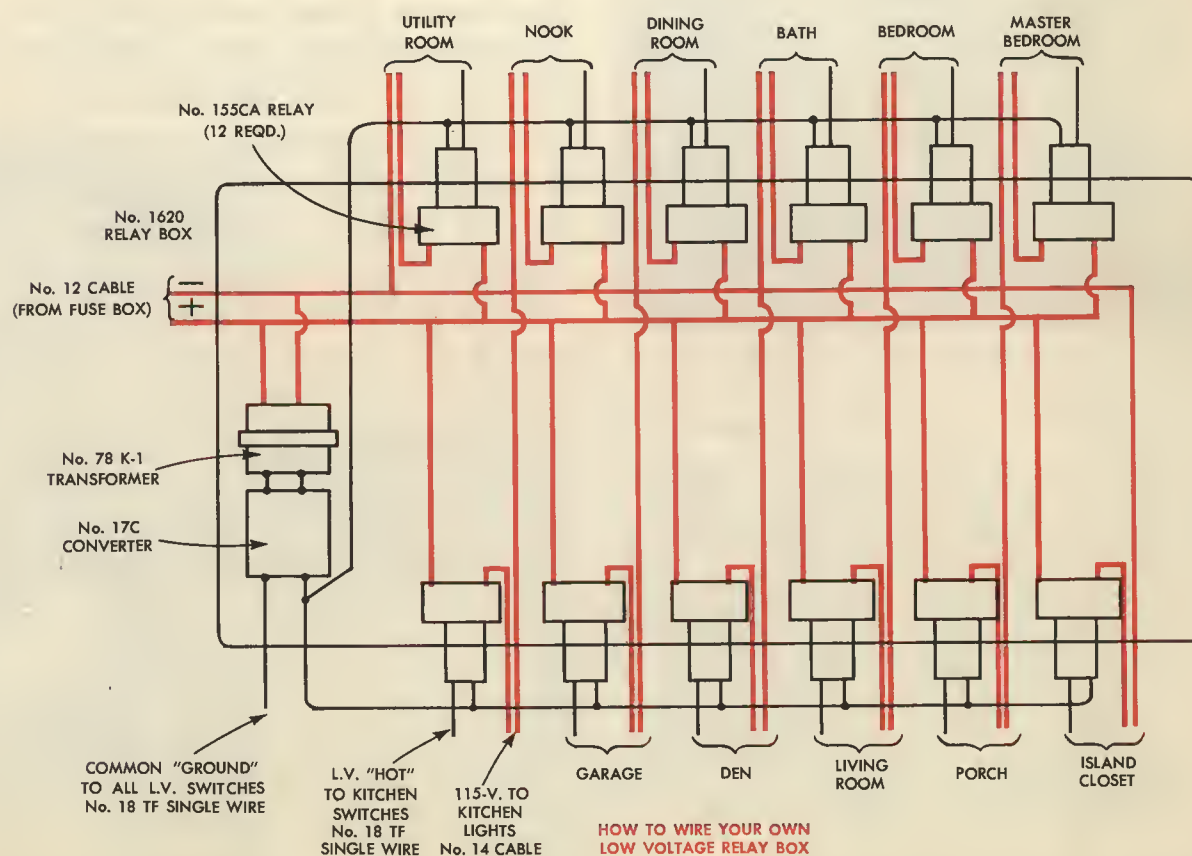
The "receptacle" lighting circuit is shown by the dotted lines in the drawing on page 75. This is similar to the kitchen-appliance circuit. No. 12 sheathed cable is run through the floor joists to the receptacle boxes in the walls above, which are all nailed to the studs 12 in. above the floor. Note that for the vestibule closet a cable extends up the wall from a receptacle box to an outlet box in the vestibule ceiling. Here, any pull-chain light fixture can be used.

The other lighting circuits contain a relay box—the key to the modern low-voltage wiring. A study of the diagrams will show you that a 115-volt supply line, 2-wire No. 12 sheathed cable, runs through the ceiling joists from the fuse box to the relay box, which is placed in an accessible spot in the center of the attic. From the relay box, stubs of 2-wire No. 14 cable run directly across the attic to the ceiling lights of each room. These short lines to the rooms are individually switched on and off by relays (solenoids) in the relay box.

The diagrams show all the low-voltage wiring that is run through the walls and ceilings from the relays to the various wall switches. The low-voltage circuits all operate as does a simple doorbell—you simply touch a push button momentarily to click the relay on or off.

This is what electricians call the Touch-Plate or 2-wire low-voltage system. As it is so new and different, this wiring can be

best described by an explanation of what it does for you. First, it means that no 115-volt wiring has to be run throughout the walls for the switches—these lines carry only 24 volts, therefore need only to be inexpensive No. 18 TF wiring or other good grade of doorbell wiring. This, in turn, means brighter lights, because the cables do not travel to the switches with resulting line-loss of current. As there is





Here is the Touch-Plate switch for the low-voltage wiring. Neither it nor the doorbell buttons require metal switch boxes in the wall.



You can assemble your own relay box as above, or buy a No. 6 box as shown below. The latter affords six relays assembled with transformers.



A button on your telephone turns off your radio through a relay mounted in the radio's wall outlet box. Doorbell wiring forms this extra circuit.

no high current to be a fire hazard, no metal switch boxes are needed on the walls—you simply attach the switch plates with screws, as pictured at left. The switches are the electrical item you are always touching; and, being low-voltage, these are non-shocking, a safety factor that is especially important in the bathroom and laundry. For the same reason, you can easily place switches outside the house to light the driveway, back yard and front door—as with doorbell buttons they do not have to be waterproofed. At each doorway, you install a double Touch-Plate switch. At night, when you are walking from one room to another, you simply brush both buttons with a finger (or elbow if your hands are full) to simultaneously turn on the light ahead and turn off the one behind you. Go back into the room behind and this “path of light” still functions—because pushing the buttons always reverses the condition of their lights, to off or on.

For the switches you can use ordinary doorbell buttons as well as the Touch-Plate buttons. This means you can install pearl-type buttons in such places as the

handy location for the breakfast-nook light, shown on page 78, and you can use the cheapest of doorbell buttons to give good, inexpensive switching throughout the garage. A very important advantage to the amateur is that no matter how many switches control one room's lights, they are simply connected in parallel to two wires as shown on page 75. The very complicated and expensive “three-way” wiring ordinarily needed when two or more switches control one light is thus completely eliminated.

Because this modern switching is the same as the simplest of doorbell circuits, it also means that you can install any special circuits you may desire—such as a master panel in the bedroom or elsewhere to control all lights in the house. To do this, you simply string one extra 1-volt wire from each relay and one ground wire (or a 13-strand cable) to a 12-button Touch-Plate master panel on the wall alongside your bed. You can place a small pearl button at the telephone to turn off the radio while you are talking or one at your bedside to turn on the coffeemaker in the morning. These latter are easily done, as shown in pictures above, left, by wiring an extra relay directly to the outlet box you wish to control.

From your pocketbook's viewpoint, this low-voltage system means you must purchase the relay box and its relays, but your pocketbook will come out about even by not needing 115-volt wiring to the switches, and you will come out with a lighting system much better and more convenient.

You have a choice of two types of relay boxes to use. The most inexpensive is the No. 1620 Touch-Plate box, in which

you mount and connect up the relays yourself. All items needed and the full wiring layout of the box are illustrated. The wiring diagram may seem confusing at first glance, but you will notice that each relay's wiring is only a repetition of the one alongside. You can also use the Touch-Plate No. 6 box, which comes prewired with six relays. The prewired unit includes six extra transformers and a six-button master panel, shown on page 11,

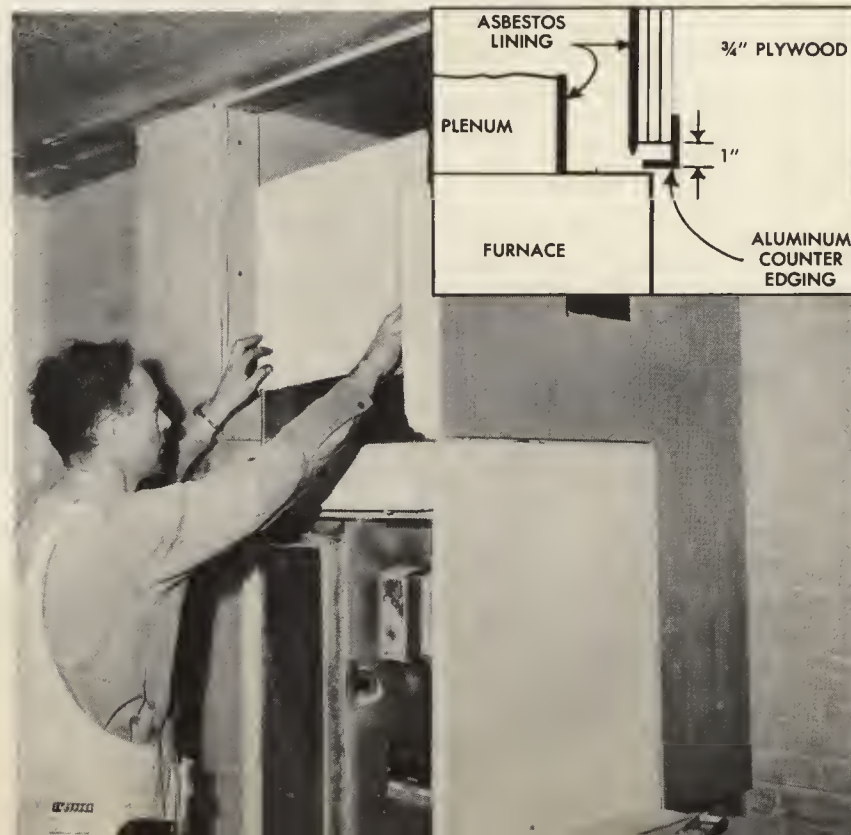
that has a tiny light behind each button to light up and tell you whenever those lights are on in the house. The No. 6 box has "knockouts" for wiring in the other six relays needed, as has the No. 1620 box.

The diagram on pages 74-75 gives a good switching layout to follow with the low-voltage wiring. Note that the switches are keyed to the ceiling lights. If, however, you would rather control the various lights from any other locations, or more

The Air-Wall type of furnace is mounted in the brick corner of the kitchen. This installation would not have been possible a few years ago.

When the furnace is installed, a hood of the same plywood used in other kitchen cabinets is used to cover reverse plenum at top of furnace.

Hooded furnace looks and sounds like a second refrigerator in kitchen. Cabinet alongside is built to slide out if furnace parts need removal.



locations, do not hesitate to do so. This is one of the advantages of the system—you can place switches willy-nilly without complications or undue expense.

The dotted lines identify the "ground" wire of the low-voltage circuits. You need run only one wire, as shown here, from each relay to the various wall switches controlling that relay. After all the switches are thus wired, you simply run a "ground" wire around the walls to ground the other side of all the switches. All of these wires should be tacked to the studs with the insulated staples used with doorbell wiring.

The breezeway and mud room are not included in the low voltage circuits, and therefore are 115-volt wiring throughout.

The doorway light of the breezeway is controlled by a 115-volt switch inside the house's rear door; the other breezeway light and the mud-room light are controlled by pull-chain switches in their light fixtures.

How to connect light fixtures will vary with the fixtures you choose. An easily-mounted outlet box will fit most ordinary fixtures but not the flush-mount type. You later cut a hole through the ceiling panels for the flush fixtures, connect the wire to the back of the fixture and then secure the

unit in place. As some flush fixtures become quite warm, you should ask your dealer if a 4-ft. length of asbestos wire is required on the lead-in.

Indirect lighting is used over the island-wall closet. These Lumiline fixtures are connected with receptacle cord that is simply plugged into the switched receptacle box mounted on the wall alongside. There is a similar arrangement for the bathroom cabinet. Here the No. 14 cable simply extends through the wall and is terminated inside the metal box of the 4-ft. fluorescent tube as shown in the detail.

The living room is lighted in the modern manner by two or more flush fixtures on a diagonal line. To truly glamorize the room, you can place fluorescent tubes in the valance boards. The tubes are placed directly over the windows so that the light streams into the rooms as if it were daylight.

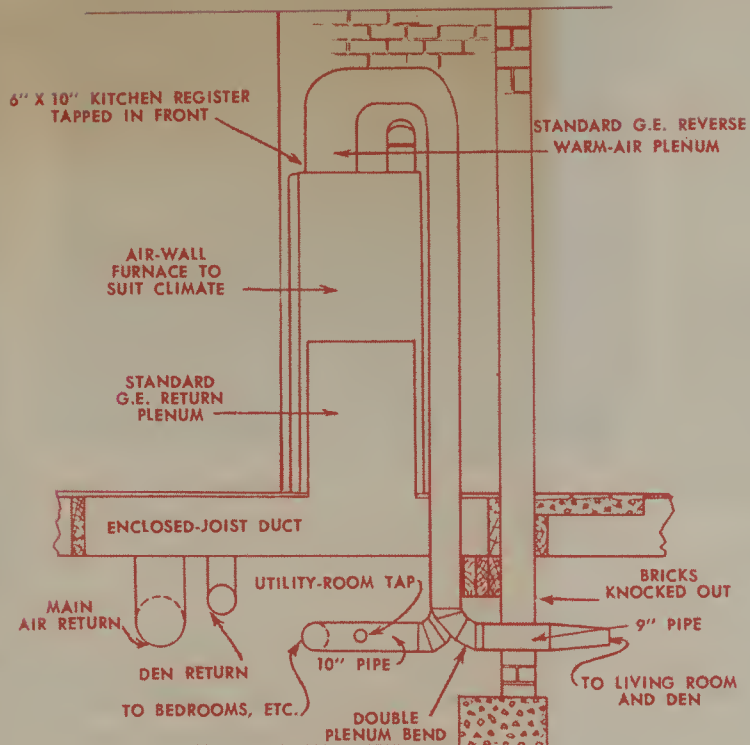
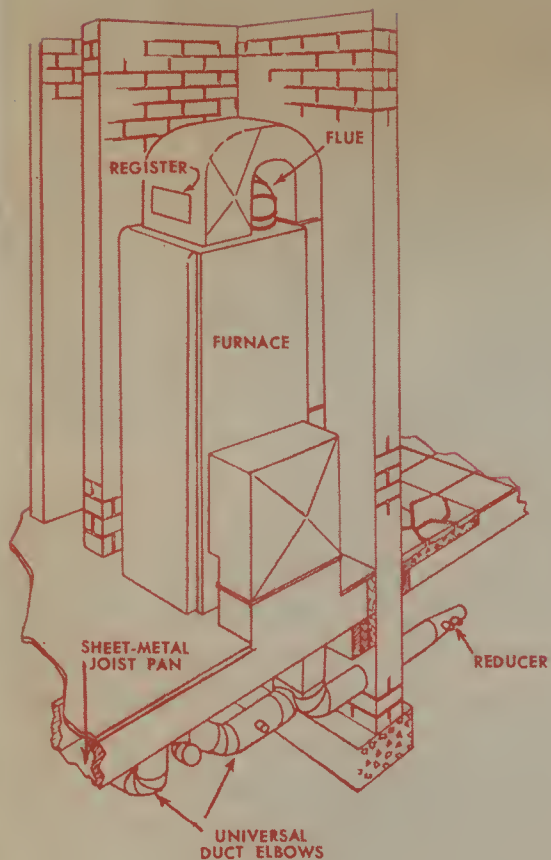
HEATING

The heating of the ranch house takes full advantage of today's improvements in heating practises. One of the most important improvements in this subtrade—especially from the amateur's viewpoint—is that the duct work of some furnaces has been simplified to the point where no

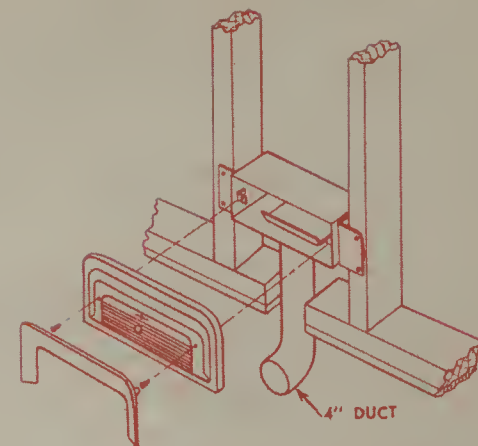
experience in sheet-metal work is required. You, of course, can have the furnace installed by experts; but, if you wish to do it yourself, the layout given here will make the job very simple and thus you can have a modern, efficient heating plant at less cost than the cheapest installed.

Another important improvement is in the furnace itself—today's quiet, compact units, either gas or oil, can be placed in corners, closets, almost anywhere. This could not be done a few years ago. In the ranch house the furnace is placed in in the kitchen, alongside the other appliances, where it both resembles and sounds like a second refrigerator. Here, the centralized ducting is highly efficient, no heat is wasted, and the furnace chimney is merely the second flue in the fireplace chimney already described.

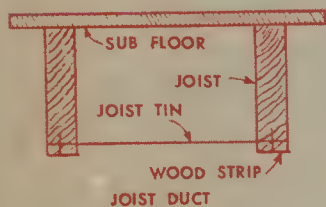
As shown on these pages, a General Electric LB-20 (85,000-B.T.U./hr.) oil-fired Air-Wall furnace has been used in the test house. The same, in a 60,000-B.T.U., LB-15 size, may be ample for your climate—check with your dealer on this—or the equivalent of either size in gas-fired models are available. Any of these can be installed in the kitchen, as shown, with a standard reverse plenum attached to the top and a standard return-air plenum



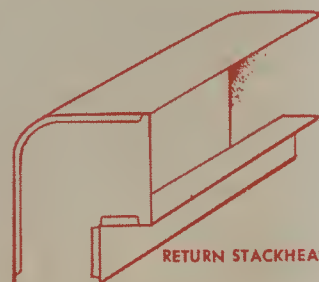
FURNACE INSTALLATION
(FOR DUCT LAYOUTS,
SEE FLOOR PLANS
AND WALL ELEVATIONS)



WALL-TYPE AIR-WALL REGISTER
(FOR BATH AND UTILITY ROOMS)



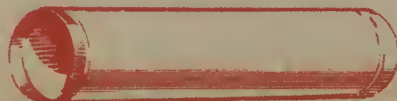
RETURN-AIR GRILLE



RETURN STACKHEAD



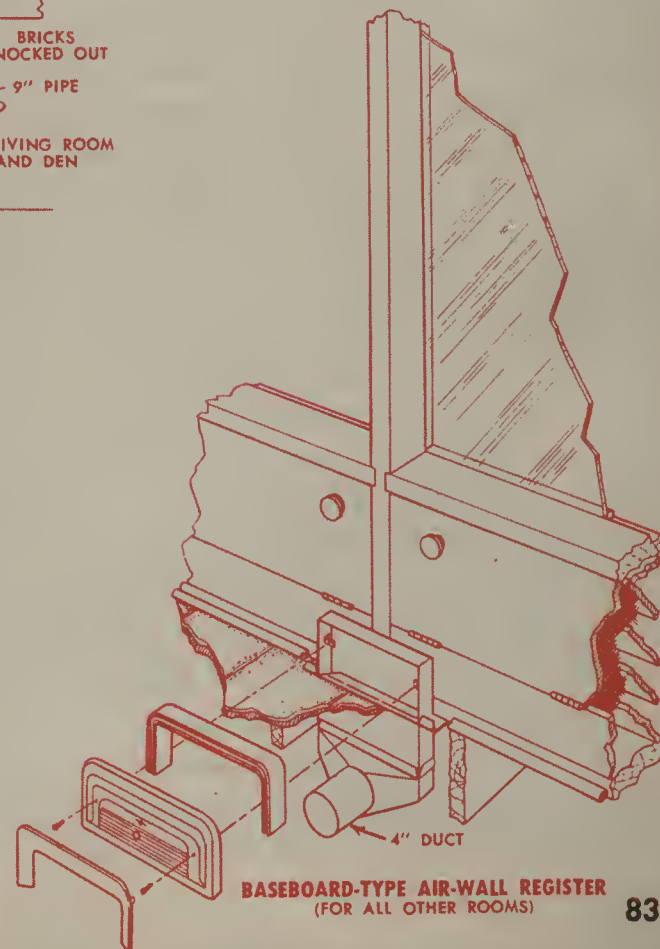
DUCT DAMPER



ROUND "STOVEPIPE" DUCT



**ADJUSTABLE
DUCT ELBOW**



BASEBOARD-TYPE AIR-WALL REGISTER
(FOR ALL OTHER ROOMS)

Return-air pipes are connected to ducts formed between the floor joists by adjustable elbows.

attached to the right side of the furnace. Note that the flue pipe is shielded by the reverse plenum, and that corrugated asbestos is pasted to the plenum and to the hood of the cabinet work. Whichever furnace is chosen is set in place to locate the flue-thimble position, and then a hole is chiseled through the brick to set the thimble in place with asbestos cement.

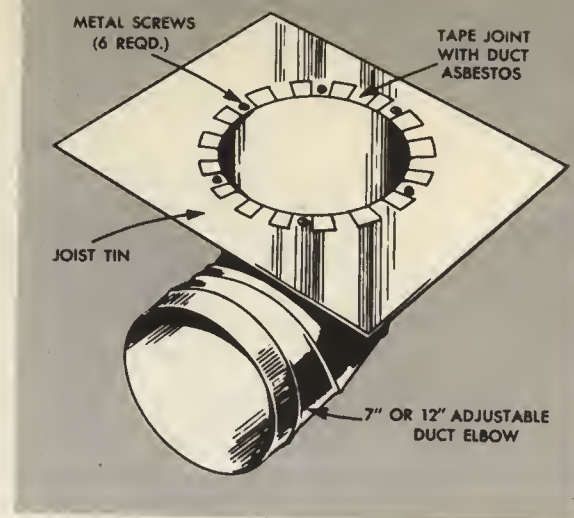
These furnaces can be screwed directly to the floor—no insulation is needed here—approximately 3 in. from the brick side wall. The electric current is supplied by the appliance circuit of the electric sink, as shown on page 74.

You can, of course, use any other furnace that you desire in the ranch house. Oil-fired furnaces with pump and motor exposed are not recommended for the kitchen locations, but can be placed in the utility room with a separate flue. You can place any of the new floor-hung furnaces in the crawl space underneath the kitchen floor, here extending the furnace flue below as explained in the basement alternate plan. For hot-water registers or baseboard heating, any of several compact, attractive oil or gas boilers can be placed in the kitchen location. In the basement



any furnace can be used; the basement is a necessity if you intend to use a coal or wood furnace.

The ducting of the G.E. Air-Wall furnaces is particularly recommended if you intend to do your own furnace work. Here you will need a pair of tinsnips and that is about all, because the galvanized or aluminum ducts fit together exactly as does ordinary stovepipe. The warm-air duct layout is given on page 34. You will note that the warm-air plenum of the furnace splits into two round supply pipes, which are further reduced by "trees" to several small 4-in. and 5-in. ducts for the registers. Duct dampers are placed in these small pipes, near the "trees" to allow adjustment of the system. A reducer to 4-in. is placed in each 5-in. line at the register. Adjustable duct elbows in all lines simplify their alignment, and all of these parts are avail-



able from your dealer. Note that a hole is at this time knocked through the brick base of the fireplace wall for the 9-in. duct pipe. All of these ducts are hung with galvanized wire to the joists above, and the joints of a completed section are sealed with strip asbestos, cemented over the joints with wheat paste. In a severe climate, the duct sections should be covered overall with asbestos before assembling.

Note in the layouts of the return-air ducting that the return-air enters the plenum of the furnace through an enclosed-joist duct. (See pages 30 and 83). These joist ducts are also used wherever the return-air runs parallel to the joists. The 7-in. and 12-in. round return ducts are joined together as with the warm-air ducts, and they are connected to the joist tins by adjustable elbows as shown above.

The main return-air grill is simply a



Most duct work is simple assembly of small round duct pipes in crawl space under the house.

10x12-in. hole cut through the floor directly underneath the island-wall closet, and the air will enter this main opening through an oak grill built in the base of the closet. Of the three smaller return grills, two are placed in the walls of the bedrooms, Walls H and K of page 41, using the return stackhead and the grill (shown on page 83), which is screwed to the walls. The third small return is a 6x12-in. floor grill placed in a hole cut in the floor of the den over its joist duct.

The detail of the Air-Wall registers is fully shown in detail drawings, on page 83. The wall type is used in the bathroom and utility room (walls H and N of page 41), and the baseboard type is used in all other rooms except the kitchen. In the kitchen, a 6x12-in. register is placed in the



Air-Wall baseboard registers require only narrow slots in subfloor beneath larger windows.

hood over the furnace. Note that the stackheads of the baseboard registers are simply slipped in slots that you cut in the subfloor between floor joists near the middle of the louvered window frames. Page 10 shows how these look when completed, the register cover being installed after the finish floor is laid. These registers will fan the warm air up over the windows above them, acting as defrosters and warming the coldest radiation area of the room to give an even temperature throughout.

CEILINGS

You have a wide choice of materials to use on the ceilings. The trusses and the ceiling joists of the ranch house are designed so that they will accept either "wet-wall" or "dry-wall" construction.

If costs are not a consideration, you can have the ceilings plastered (wet-wall construction) by skilled workmen. But unless you have had some experience with plaster, it is not recommended that you attempt this yourself. A good plastering job requires both skill and experience, and you never know how good the job is until it is too late. However, you can do the lath work yourself. There are three types of lath to choose from—wood, metal or plasterboard—or you can ask your plasterer which to use. Plasterboard lath is the most popular today, being the least expensive and requiring the least plaster.

Dry-wall ceilings are less expensive, especially so when you do the job yourself. Of the various dry-wall ceiling materials, plywood installed as shown on these pages is particularly recommended. If you follow these directions, you will obtain a modern "plastered" ceiling equal to the best plastering job and at considerably less cost. Furthermore, you will have a ceiling without the diagonal and corner cracks of plaster and without the tell-tale joints of taped dry-wall ceilings.

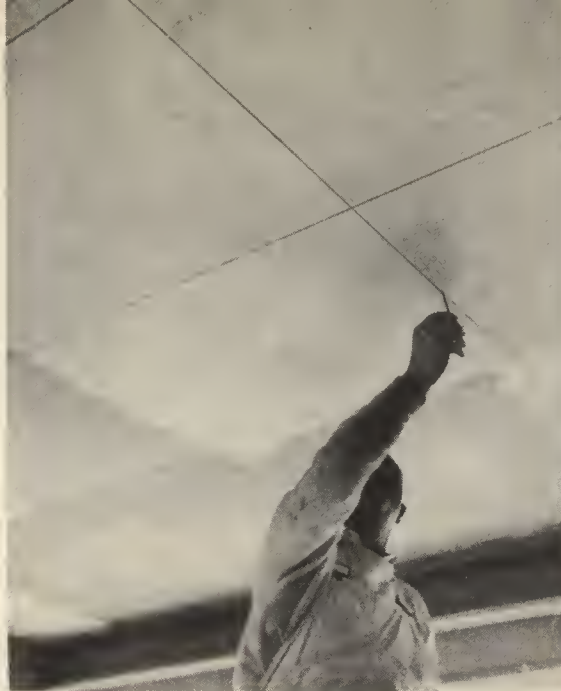
Note on page 86 that wood furring is placed underneath this plywood ceiling. First, scrap pieces of lumber are nailed down to the top plates of all partition



Rough furring is placed on the ceiling joists as shown before gluing on the sheets of plywood.

walls that run parallel to the ceiling joists. These scrap boards should extend over the edge of the plates an inch or so—to give a nailing base for the furring. Then 1x3 furring strips are nailed to the ceiling joists and, along the walls, to this blocking. Note that every other joist is furred, as shown on page 87. Furring also runs crossways to the joists every 24 inches, thus giving a 24 x 32 in. rectangular pattern. Use 8d box or common nails to secure the furring.

Standard 4x8 sheets of $\frac{3}{8}$ -in. plywood (plypanel) are now marked off on this same 24 x 32 in. pattern—by a line down



Ceiling of large, perfectly laid rectangles of plaster avoids cracks, reveals no telltale joints.

the middle and two lines across the sheet on 32 in. centers. As is pictured above, shallow V-grooves are cut along these lines to "tile" the sheets. Use a straight-edge and either a small hand electric router or your skillsaw (with an old blade with teeth filed down to give a V groove) to cut these grooves to a depth approximately the thickness of the first veneer on the plywood. The edges of the plywood sheets are planed slightly so that their joints will also form a V-groove.

Next, a phenolic-resin glue or similar waterproof glue is brushed generously on the furring strips, excepting those strips



Electric router or saw lightly scores sheets of 4x8 plywood for the "quiet-paneled" ceilings.

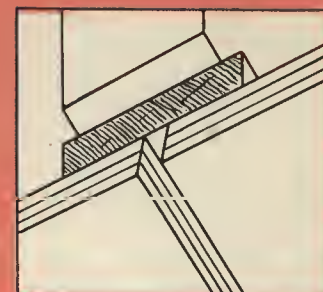
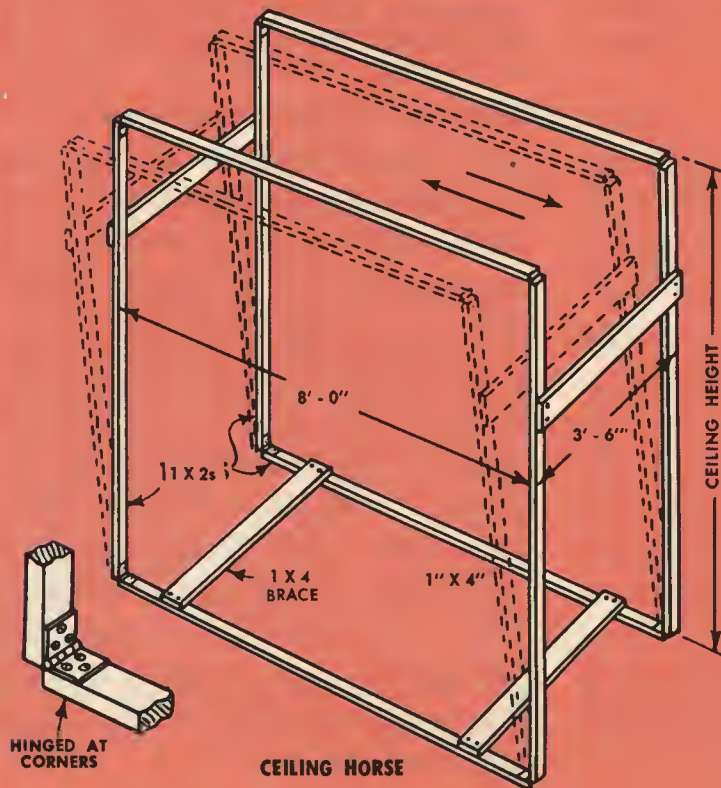
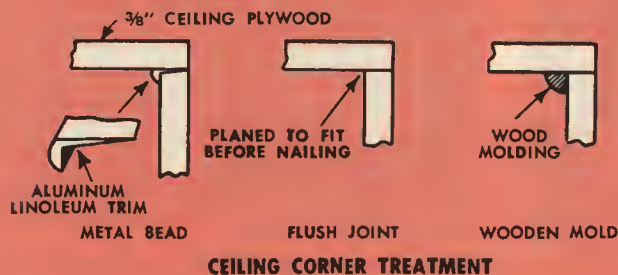
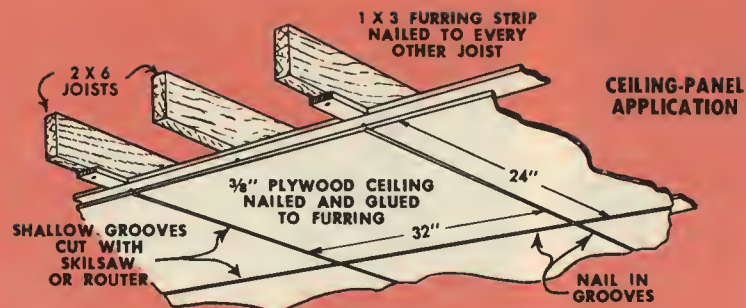
around the edge of the ceiling. Then the plywood sheets are nailed in place with 4d finish nails every 6 in. Driving the nails on a slight slant will give better holding power. Across the sheets, you place the nails in the shallow grooves where they will be hidden. Main purpose of the nailing is to hold the panel in place until the glue sets. Note the ceiling "horse" shown on page 87. One person can place the big sheets easily with this horse, and with the 4x8 sheets can do the job rapidly.

This construction gives you a very crack-proof ceiling. As the house frame dries out, any shrinkage will be taken up between

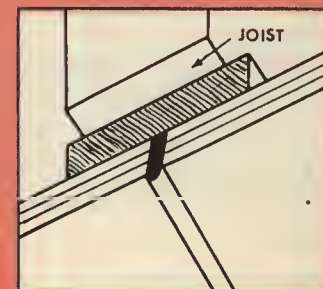
the furring strips and ceiling joists—that is why they are nailed but not glued together. The plywood panels, of course, cannot crack and their joints are just as permanent, being glued together to the furring to give one solid ceiling. The edges of the ceiling are left unglued so that they can “float” or give if shrinkage in your house is considerable, thus preventing any bulge or warp in the paneling.

In such small ceiling areas as the vestibule closet, it is not necessary to “tile” the plywood. One sheet can be cut to fit the entire ceiling and thus will have no joints. If desired, you can change the size of the “tiling” in the various rooms, but the pattern must be on some multiple of 16 in. to fit the ceiling joists.

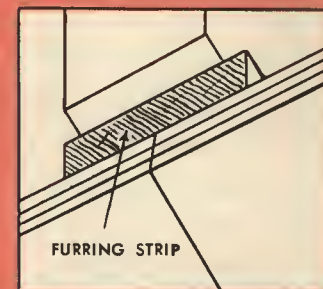
The finish recommended throughout the house for this ceiling is what architect John Whelan calls the “quiet-paneled treatment.” Childishly easy to do, it will give you, as shown in the photos, a ceiling best described as resembling perfectly-laid rectangles of plaster. This, of course, you will put on later. First, any prominent nail holes are filled with Swedish putty (spackle to which a little paint is added). Do not be too greatly concerned with this puttying because small holes and hammer marks will be covered by the finish. Next,



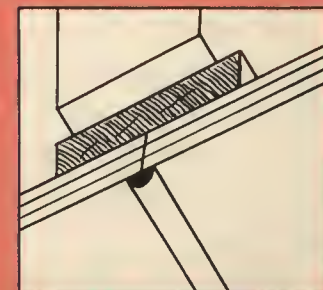
RECESSED



BULLNOSE INSERT



FLUSH



WOOD MOLDING

OTHER CEILING TREATMENTS



Doubled, or underlay method, is being used here to install the walnut-panel living-room wall. You have a choice of this or single-panel method.



Here the walnut panels are installed over the underlay of 5/16th-in. unsanded plyscord. If walnut comes from same flitch, grain will match.

a thick coat of a plastic-base texture paint, such as Art-Tex, is brushed on with a calimine brush. While still fresh, this paint is stippled by sponging it with a flat rubber sponge obtained from the dime store. Just sponge straight up and down from the surface without twisting.

The grooves of the paneling are then cleaned out with a matchstick. After this texture coat has dried a day or two, one coat of a flat wall paint is brushed on to give the color desired and a washable surface.

That is all. The only trick is to brush the texture coat on just one or two tiles at a time to stipple it while very wet. You

can use a stippling brush or roller instead of the sponge, but a sponge is the easiest.

Other ceiling treatments with plywood are shown on page 87. All can be used with the furring strips already described. These are recommended when you wish a natural wood finish or bleached wood finish on a ceiling. The bullnose insert, wood molding and recessed treatment of the panels (paneling in whatever size rectangles you wish) are good for any type of softwood or hardwood plywoods. The flush joint is advisable only with the plyweave and striated plywoods which have rough-textured surfaces to hide the otherwise open joint.

You also have a wide choice among other dry-wall ceiling materials—plasterboard, pulp or fiberboard and the various ceiling tiles of soft and hard fiberboard. Most of these are quite simple to install, especially the fiberboard tiles, because they do not require hidden joints. Installing plasterboard with hidden “taped” joints is not particularly recommended for the amateur as it is quite a problem to keep the tell-tale cracks from appearing later on, and, as with plaster, you never know until later.

WALL PANELING

Now the finish walls of the ranch house can be installed, and you will find that your house is beginning to resemble a home. As already mentioned in the start of this book, the interior finishing is where the amateur is most apt to have trouble; therefore the ranch house is designed on a 4-ft. module so that you can easily finish these walls with plywood. You can, of course, have the walls plastered by experts if cost is not a factor; but here you will not only save a considerable sum by being able to do the work yourself, but you will also obtain the best of modern finishes and will find that the trimwork, the next job, is much easier with the paneled walls.

There are a multitude of plywoods to choose from, and there are several excellent ways you can finish them. With the "dry-wall" construction, all rooms need not be treated alike, as is done with plaster. If you wish, you can further intermix the wood-paneled rooms with plastered rooms or other dry-wall finishes.

The POPULAR MECHANICS house gives an example of one good way the rooms can be completely finished with plywood, but there are so many plywoods to choose from today that perhaps the best way is to look over the samples at your lumber yard.

The living-room wall alongside the fireplace of the test house is of expensive walnut plywood. Here a contrasting wall of walnut or other top-quality hardwood is highly recommended because it definitely adds a luxury touch to the house and only requires three sheets of the material to cover this wall. At no extra cost, you can order these three sheets cut from the same flitch, which means that they are succeeding cuts from the same log. Thus, the grain pattern in each will be the same, subduing the joints and giving a very pleasing effect.

The other walls of the living room, dining room and hallway in the test house are

the same; vertical-grain fir plywood finished in a blond adobe-brown color. The bedrooms are common-fir plywood covered with grass-cloth wallpaper, a very inexpensive wall that gives a perfect papering job. The kitchen and bathroom are of vertical-grain fir plywood, enameled. The den is walled with the new plyweave plywood, which is ordinary fir plywood run through rollers under steam and pressure to give a hard-pressed leathery surface. The utility room is ordinary fir plywood, enameled. The closets are the same, finished with flat wall paint.

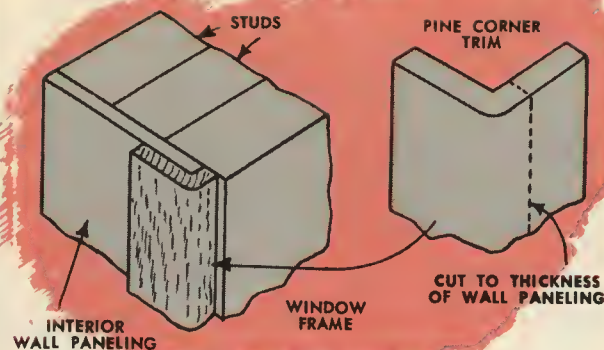
Other good softwood plywoods that can be obtained at modest cost include the striated and combed panels (similar to the embossed) and the redwood and cedar plywoods. At slightly higher costs, you can use the cheaper hardwoods, such as gumwood and Philippine mahogany.

The main trick in installing plywood walls correctly is to be as careful as with a plastering job. Gluing is important. You may spend \$15 to \$20 for glue, but this more than anything will give you good walls throughout the years. A cold phenolic-resin or casein glue is best. A drawing on page 91 shows two ways to economically install the panels on a wall. The first is to nail and glue $\frac{3}{8}$ -in. panels direct-

ly to the wall studs. The other is to first place an underlay of $\frac{5}{16}$ -in. plyscord and then a finish layer of $\frac{1}{4}$ -in. plywood. This second method is used with the more expensive hardwood panels, with which, for economy, you will use a finish layer of only $\frac{1}{4}$ -in. thickness.

The photos on page 88 show the underlay method being used on the walnut-paneled living-room wall of the test house. Here the underlay of $\frac{5}{16}$ -in. plyscord is nailed crosswise to the studs with 6d common nails. The final layer is glued and nailed to the plyscord with 4d finish nails every 6 in. Place the nails on a slight slant. Apply the glue liberally with a brush on spots here and there underneath the panels and everywhere along the joints. Page 93 shows one layer of $\frac{3}{8}$ -in. plyweave being installed on the den walls. Here you apply glue liberally to the studs and nail with 4d nails every 6 in. as before. With either method, a row of 2x4 blocking should be placed at a 4-ft. height between the studs of the interior walls, as already recommended for the exterior walls.

There are various types of joint treatment you can use, as shown on page 91. Surprisingly, some of the best paneled walls are obtained by the simplest of these,



TYPICAL DOOR AND WINDOW TRIM

The valance boards, if desired, are a simple frame installed after all the walls are in place.

the slight V-joint and the open recessed joint. With the latter, you first glue and nail a narrow strip of the same plywood behind the panels. With the V-joint, additional V-grooves can be cut on 8 or 16 in. centers the length of the panels before installing them. This gives a modern wall of seemingly perfect-laid vertical boards. The vees are cut the depth of the first veneer with a skillsaw or electric router, as were the grooves in the ceiling panels.

Special Weldwood molding is used on the two outside wall corners of the hallway and the one of the vestibule closet. The metal molding is nailed to the corners first, then the panels are simply pushed into place to obtain a perfect fit. Various ways of finishing the joint at the

ceilings are illustrated. The linoleum-trim method is especially good to use in the kitchen and bathroom. This is a common, very small aluminum trim that can be driven into place with a hammer and block of wood. The joint at the floors can be very rough, because the baseboard will later cover this joint.

With accented (open or molded) joints, the trick of attractive wall paneling is to work from the window and door openings, as shown in the three basic methods illustrated on page 91. You can, of course, vary or enlarge the pattern of the paneling in many ways, but by starting with one of these basic patterns you will insure a good design.

Flush joints present a different prob-

lem. If you desire a smooth wall with flush joints—say the varnished walnut paneling—the joints must be very carefully fitted together and any rough spots planed down. This is best done by planing the back edge of the plywood at the joint. Flush joints with the plyweave or striated plywoods are no problem at all, because the texture of these panels makes any joint practically invisible. These latter probably give the easiest wall installation known, and they are very attractive in the living room and den and also in the bedrooms if you do not desire paper on those walls.

For top-quality enameled walls in the kitchen and bathroom, vertical-grain fir plywood can be used. You can also use ordinary fir plywood (plypanel) here, but on a large expanse of smooth enameled wall the grain pattern of the rotary-cut plypanel will show through the paint coat to some degree. The vertical grain is just fir plywood, but it is quarter-cut in the mill—as with expensive hardwoods—to give a smooth ungrained surface for painting. Because they are to be painted the flush joints and nail holes here are filled level with Swedish putty (spackle to which a little paint is added). Before painting, the filled joints are sanded slightly. With

a small electric sander, you can do this in a jiffy, and the glued joints will be permanently invisible.

Though somewhat more complicated, another method of obtaining a perfectly smooth enameled wall is to apply painter's muslin, sometimes called tobacco cloth, over common plypanel. First, the flush joints and nail holes are leveled with Swedish putty, and then the wall is primed with a thin coat of flat white paint. Over this, the muslin is hung with wallpaper wheat paste. Overlap the canvas about 1 in., draw a sharp razor blade down the center of the overlap, and remove the narrow cut-off strips from both pieces of muslin. When the paste dries, you thus will have a perfect butted joint. A coat of wallpaper sizing is then applied to the muslin and over this any conventional enamel finish. With either of the above enameled finishes, the panels around the bathtub should be exterior (waterproof) plywood.

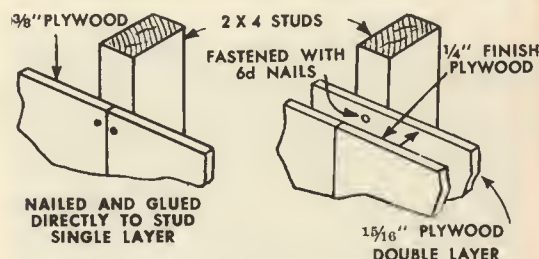
For a papered wall, the common fir plypanel will give you an excellent job. First,

$\frac{3}{8}$ -in. plypanel is glued and nailed to the studs with 6d common nails. For economy, you can substitute $\frac{1}{4}$ -in. panels under wallpaper. All joints are filled with the Swedish putty and, if you are applying the paper directly to the panels, the nails should be set slightly and puttied to prevent any possibility of rust spots staining the paper. After the filler has dried, the joints are sandpapered.

With thin wallpapers, the usual layer of deadening felt or wallpaper liner is placed on the plywood first. For this the wood panels are sized with a coat of wheat-flour paste to which a gelatin size is added. Then the felt is applied with the same, and the wallpaper is hung with plain wheat

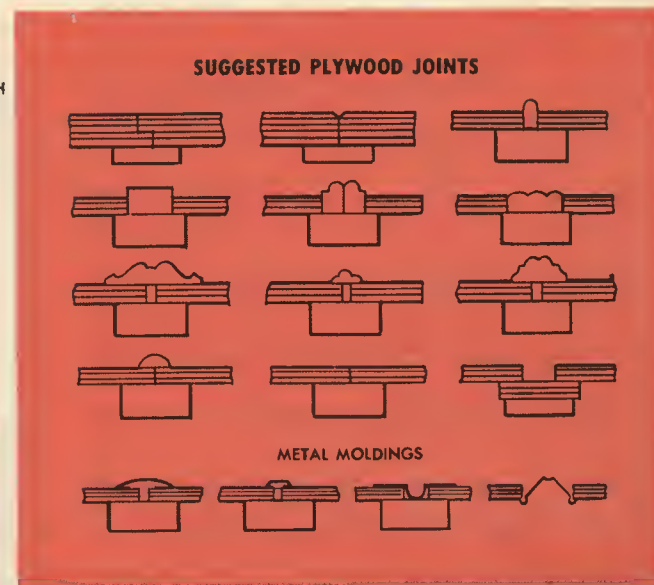
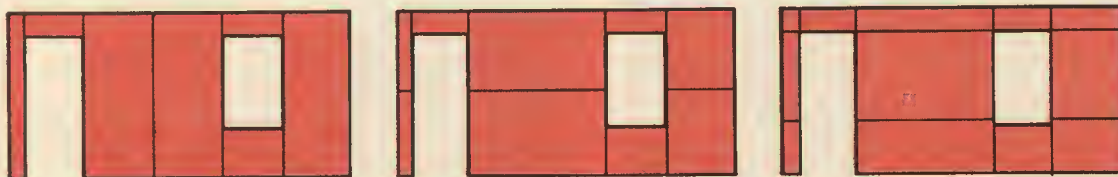
paste. If you like the grass-cloth wallpapers, or the various imitations and similar rough papers, you can omit the deadening felt. Size the plywood as above; then apply the paper directly with wheat paste. Either method will give an exceedingly smooth and durable wallpaper job that cannot crack.

Interesting effects in the modern manner can be obtained by finishing one wall of a room with a contrasting material. As shown on page 108, one wall of the den in the test house is paneled with plypanel, then covered with cork tile. This gives a very attractive wall and is especially good if you wish to subdue a doorway that cuts into the wall surface. The door also is



THE TWO METHODS OF WALL PANELING

THREE BASIC METHODS OF WALL PANELING



covered with the cork and no trim is used—at the edges the cork tiles are rounded slightly with sandpaper.

A similar treatment is to use a lightweight plastic leatherette on the wall. This comes in a variety of colors and designs and is available through the larger mail-order houses and department stores. It is sized and glued as with grass cloth wallpaper and can give you a very striking wall.

The other dry-wall panels—the hardboards, pulpboards and plasterboards—can be substituted in various rooms or throughout. Some of these are available in a selection of tiles and plank forms that can give a pleasing pattern on the walls. For a tile size that does not match your stud spacings, wood furring or 5/16-in. plyscord underlay must be installed first. Some of the hardboards are very good in the bathroom and kitchen, having a hard, smooth surface that is even prefinished in colors in some cases. These must be paneled with a metal or wood molding, and cannot be flush-jointed without showing.

As on the ceilings, plasterboard with taped “hidden” joints is not an easy job for the amateur. Plasterboard, however, can be paneled with various moldings or used as a base under your wallpaper. The

soft pulpboards are not recommended on the walls except above a wainscoting of other material—they are too easily scuffed and damaged. As with the many finish plywoods, you should examine samples of these materials before choosing.

Before paneling the walls of the dining room and kitchen, the fluted-glass partition wall must be built. This partition is nailed in place through the ceiling panels the joists above and to the window framing between the nook and dining-room windows. Center the partition on the window framing. Note that the doorway and “window” openings are framed of clear 2x6 lumber. The rest of the partition can be common material.

There are several types of fluted glass you can choose from. The drawing on page 40 shows two ways the glass can be installed, one giving sliding panels that can be opened for a pass-through. Also, the sliding glass can be placed on one side of the 6-in. frame and a solid pane on the other, giving you an enclosed space that can be shelved and used as an attractive display case for glassware or what-nots.

FINISHING AND PAINTING

Now a word about the plywood finishes.

You have probably noticed ordinary plywood (plypanel) on walls, stained with walnut or mahogany stains. Although commonly used, this is the one wall finish you should definitely avoid! It gives an extremely depressing color to fir plywood, and it accents every seam, flaw and grain-ing of the panels.

These problems are easily overcome by using a bleached or blond finish, similar to those used on modern furniture. These, if anything, are actually easier to put on than the ordinary stain and varnish.

The important thing is to introduce a little paint pigment on the wall to reduce the pronounced grain of the wood and to keep the walls light in tone. A good natural-wood finish (blond) is easily obtained by applying one thinned coat of clear shellac, followed by one coat of flat white paint rubbed on with a rag (following the grain) and a final coat of dull varnish or floor wax. A “bleached” wood finish can be obtained by first applying one thinned coat of white resin sealer such as white Rez. Before this is tacky, it can be wiped down to a lighter tone. After a light sanding, one finish coat of shellac, varnish, lacquer or wax is applied.

The above give natural wood finishes. If you desire to change the color of the

walls, simply apply one thin coat of the white resin sealer, then a rubbed-on coat of paint in the color you desire, and finish with shellac, varnish, lacquer or wax. In the test house the living-room walls of vertical-grain fir (which is finished the same way as plypanel) were given one coat of white Rez, then a rubbed-on coat of adobe-brown paint, and then floor wax. This gives an excellent finish that will not show up scuffs, blemishes or fingerprints.

An exceedingly simple but good finish can also be obtained with the new stain waxes. A coat of stain wax, white or whatever color is desired, is applied and rubbed

down to the desired shade. When this has dried, a good coat of floor wax is all that is needed.

On such as the walnut paneling—where you will probably desire to accent the grain—the surface should be stained in the ordinary manner and then varnished or lacquered. For a more subdued effect, the surface is sealed with a clear resin sealer or shellac, rather than stained. For a non-glare finish, the final coat of varnish or lacquer is buffed lightly with 3/0 steel wool.

The plyweave panels used in the test house were finished very easily by simply

applying one coat of white resin sealer, then a coat of color paint brushed into the textured surface and wiped off the high spots with a rag. This gives a very leatherlike finish to the plyweave. A final coat of wax finishes the job.

As already mentioned, common-fir plywood (plypanel) will give an attractive wall if finished with the blond or bleached treatments, but will show its grain pattern to some degree through enamel. However, in the utility room, where the walls are broken up by cabinets, the enameled plypanel is quite satisfactory.

On the exterior of the ranch house, the best paint for the plywood siding is the same as for ordinary wood siding—either the “pure” white-lead-and-oil paints or the TLZ (titanium-lead-zinc) paints. The most important here is the primer coat, which should go on immediately after placing the siding. Exterior primer, thinned with one quart of raw linseed oil per gallon of paint, is good. Aluminum primer, compounded from aluminum paste and long-oil spar varnish, is also an excellent primer to use. Thin your primer well, so that it will penetrate deeply into the wood. Many painters recommend back-priming the rear side of any exterior siding, and in damp locations this guards against peeling.

Single-paneling job being done in the den with new plyweave plywood. This is one of the simplest and yet one of the best wall installations.



A closeup of plyweave plywood—which is common fir plywood run through a roller to give it a leatherlike texture which hides all joints.



VALANCES

Valance boards can easily be built over the windows of the living room, dining room and den, as shown in the accompanying drawings. These are entirely optional—if you prefer other drapery installations, leave the valances out. They can be dual-purpose; can give soft indirect lighting throughout the room as well as carrying the draperies.

As shown in the detail, the valance boards are simple boxes framed with 1x6s in the corner of the ceilings. They are most attractive if built from wall to wall

Fluted-glass partition wall is paneled like other walls of kitchen and dining area. The exposed framework is made of clear 2x6 material.

completely across the room over the windows. Thus they will seem a structural part of the room, not just a box over the window. For the same reason, the facing board should be $\frac{3}{4}$ -in. plywood of the type and finish that you have chosen for the nearby walls.

Note that the traverse rods are set back snug against the wall so that the folds of the drapes will have ample room in front of them. Use a rod in this location such as the Jiffy-Join wood traverse rod, which is simply tacked to the 1x6 member. Tapes sewn to your draperies slide in the rods, and no pull ropes are needed.

As shown, fluorescent tubes can be placed in the valances for indirect light-

ing. Any standard 4-ft. fluorescent tubes can be used, but are placed only above the windows, not where the valances extend over a section of solid wall. Thus, the lighting at night will enter the room from the same source as daylight—a simple but very effective trick in indirect lighting. It is best to obtain your tubes before framing the valances, as their heights may vary. The bottom of the tubes should be a minimum of $\frac{1}{2}$ in. above the edge of the plywood. They are available from electrical dealers and the mail-order houses.

INTERIOR TRIM

Your interior door and window trim can be installed in an exceedingly simple and attractive manner. In today's modern homes, the trend is to get away from the wide trim or casing of the usual woodwork, which shows up scuffs and finger-marks. An advantage of the modern trim shown here is that you did not have to know the exact thickness of the paneling being used in each room when you installed the window frames. You simply cut the trim at this time to fit the wall thickness, as shown on page 90 for the

Tom Riley installs common plywood in utility room. As this is to be enameled, the joints are filled with Swedish putty and then sanded.



windows and on this page for the doors.

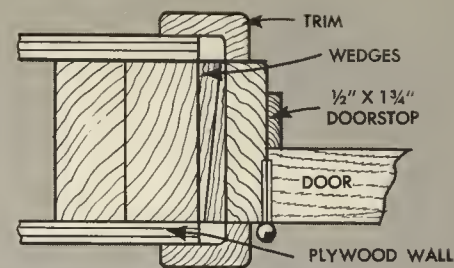
The trimwork is made from corner trim, also called outside-corner molding. This is a common wood molding, usually carried at lumber yards in $1\frac{1}{2} \times 1\frac{1}{2}$ -in. size. A $1\frac{1}{4}$ -in. or 2-in. size is just as acceptable. For painted trimwork, pine molding is good. For varnished hardwood doors, a stained corner trim of the same hardwood is preferable.

The detail on page 90 shows how one side of this molding is cut down with your table saw to the thickness of the paneling in the room where you are working. All doors and windows are trimmed alike, and you can leave the trim just slightly thicker than the paneling, if anything. The corners are mitered with your table saw or a small miter box. When installing the trim, spread glue on the underside along the mitered corners to prevent the molding from shrinking and opening the joint. As all interior trim is subject to some shrinkage or expansion before it is finally sealed by the finish, it is a good idea to fully prime the pieces, or just back-prime if to be stained, with a white undercoat or aluminum primer.

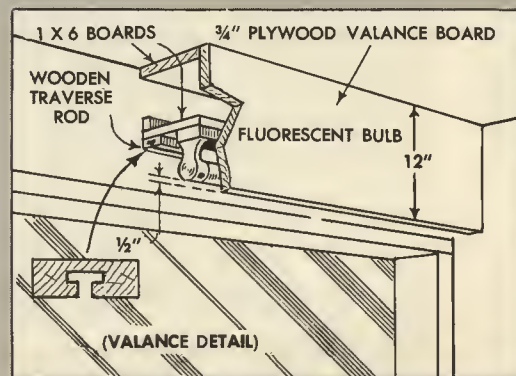
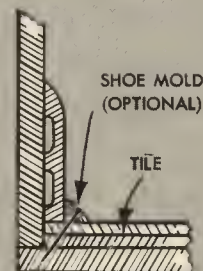
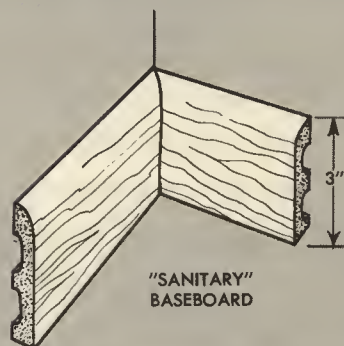
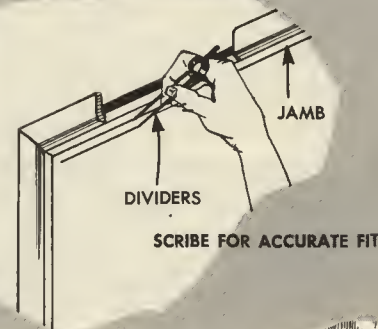
The fluted-glass partition wall between kitchen and dining room is trimmed as the other windows. On the large, louvered



INSTALL AND PLUMB
FRAMES WITH SHINGLES



SECTIONAL VIEW OF INTERIOR DOOR



(VALANCE DETAIL)



FIT DOOR WITH $\frac{1}{2}$ "
CLEARANCE FOR RUGS

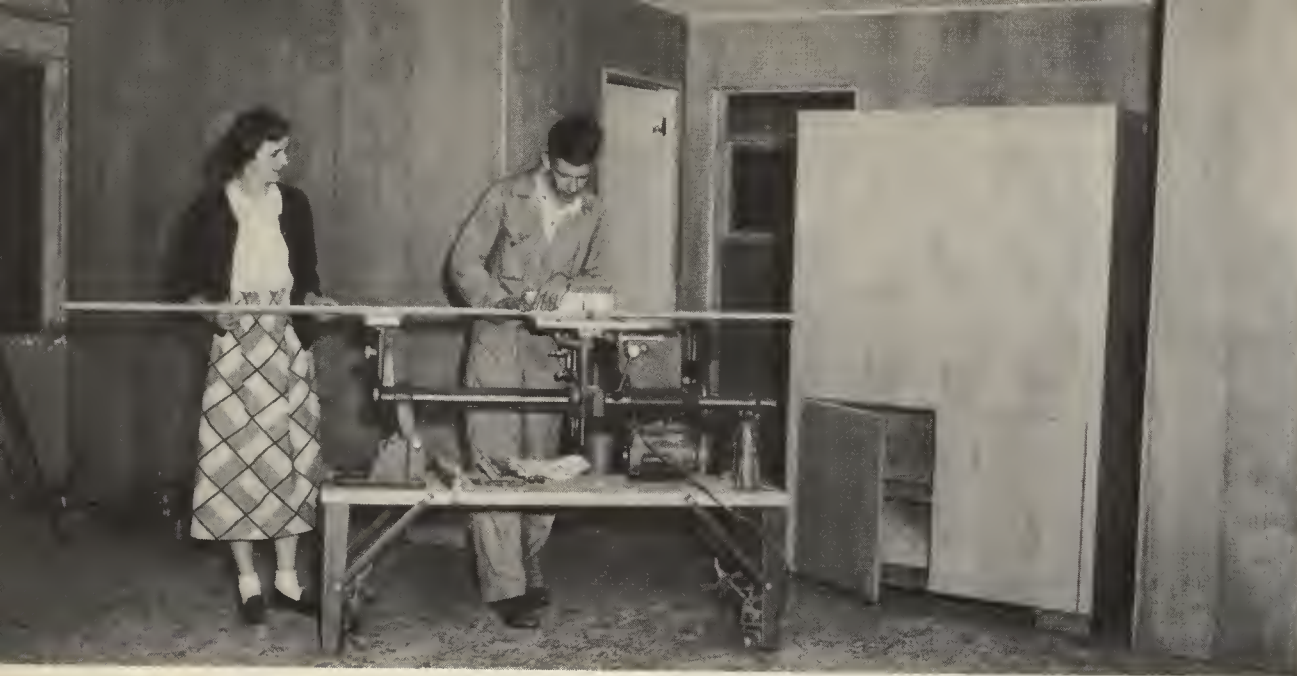


Table saw enables the amateur to cut and miter accurately interior trimwork and cabinetwork.

windows, extend the trim all the way to the floor—this enhances the window-wall effect of these windows. Do the same on all doorways; baseboards will be butted against the side of the trimwork here.

Note that the door jamb or doorway frame must be installed before the trimwork is placed. The jamb needs only to be a simple frame built of $\frac{3}{4}$ x $3\frac{5}{8}$ -in. (1x4) finish lumber. It is plumbed and wedged with pieces of shingle, as you did on the exterior doors.

HANGING DOORS

The flush type of door is the best to use in the ranch house. Six standard 2 ft. 6 in. by 6 ft. 8 in. interior doors are

needed; the inexpensive $1\frac{3}{8}$ -in. lightweight type being perfectly satisfactory. First, the sides of the door are planed or cut just enough to permit standing the door in the opening. Then the bottom is cut off 1 in. above the subfloor ($\frac{1}{2}$ in. for the finish tile flooring and $\frac{1}{2}$ in. for rug clearance). For other flooring, such as hardwood or carpeting, this clearance should be varied to fit. Then the door is set in the opening on blocks to scribe the top as shown on page 95. The door should have a clearance on top of $\frac{1}{8}$ in. and $1/16$ in. on the sides. The $\frac{1}{2}$ x $1\frac{3}{4}$ -in. door-stop can be placed on the frame after the door is hung.

Two hinges are used on these interior

doors, and tubular locks are preferable, because they require only a board hole for the latch bolt instead of a complicated mortise. The top and bottom of each door should be sealed with shellac soon after hanging to prevent warpage.

The two accordion doors for the kitchen and den entrances are exceedingly simple to install. You can substitute swinging doors here, but the accordion type is never in the way and is a decorative feature of the wall. These are standard, measuring 2 ft. $10\frac{1}{2}$ in. by 6 ft. $8\frac{1}{2}$ in. Modernfold doors, available through your local dealer or New Castle Products Co., New Castle, Ind.

No hinging, wood stop or doorlock is needed with an accordion door, all these being integral in the door. The door runs on a metal track, which is simply screwed in the middle of the door jamb at the top. One side of the door is attached by metal brackets to the side jamb. Both these doorways should be framed to the dimensions given in the drawing on page 40.

CABINETWORK

Now you are face to face with a most important part of your new home, the



Wardrobe-closet framework, installed after bedroom walls are paneled, serves as partition.

purchase a sheet of $\frac{5}{8}$ -in. that will do here and a sheet of $\frac{1}{2}$ -in. that will do there, you will have so much odd-sized waste by the time you have finished the cabinet-work that it would have been just as cheap to have used the heavier and better $\frac{3}{4}$ -in. throughout.

That table saw you have been using will prove invaluable for cutting straight lines and miters of the cabinets. A good trick used by contractors is to move the table saw from room to room as you progress. Retractable casters on the table legs are handy for this purpose.

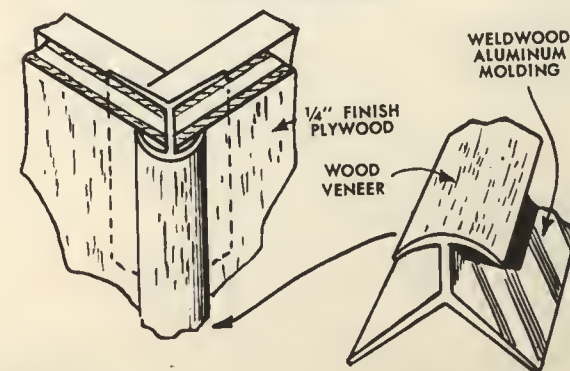
WARDROBE CLOSETS

The two wardrobe closets are built now—after the bedroom ceilings and walls are paneled—to form the partition wall between the bedrooms. The 2x8 header for the overhead track is supported at each end by a 2x2 cripple nailed to the wall. The track hardware is given in the material list. Three lightweight 3 ft. by 6 ft. 8 in. flush doors are used for the sliding panels of each wardrobe. You can substitute sheets of $\frac{3}{4}$ -in. plywood here, but they must be well-painted with a good sealer before hanging to minimize warp-

age. If you are planning the wardrobes finished with one of the blond wood stains, the $\frac{3}{4}$ -in. overhead facing and side pieces should be of the same wood as the sliding doors.

Note that the upper storage shelves are supported at the middle by $\frac{1}{4}$ -in. iron rods through the ceiling, so that no chest or other support has to be placed below in the middle of the wardrobe. The chests are entirely a matter of your preference. They can go on each side or in the middle, can be to the heights shown or reach the upper shelving. A 30-in. high chest is the maximum, if women's blouses, etc., are to be hung above it; the 27-in. high chest is the maximum for men's suits. As these are not a part of the structure, you also can purchase ready-made, unfinished chests of drawers and simply slide them in the completed wardrobes.

EXPOSED-CORNER TRIM FOR LIVING ROOM



finish cabinetwork, which can make or break any house. But do not be too concerned. The cabinetwork throughout the ranch house has been architecturally designed by John Whelan to give that extra appeal and extra usefulness that makes a real home. It also has been made exceedingly easy for you to do.

If you have built the ranch house of plywood, there is an extra advantage now in that the "drop-off," or scrap pieces of the flooring, walls and ceilings, can be used up in the cabinets and drawers—odd corners that consume a considerable amount of material if you have to buy it. However, you will notice that the cabinetwork on these pages almost invariably specifies $\frac{3}{4}$ -in. plywood. Why? If you

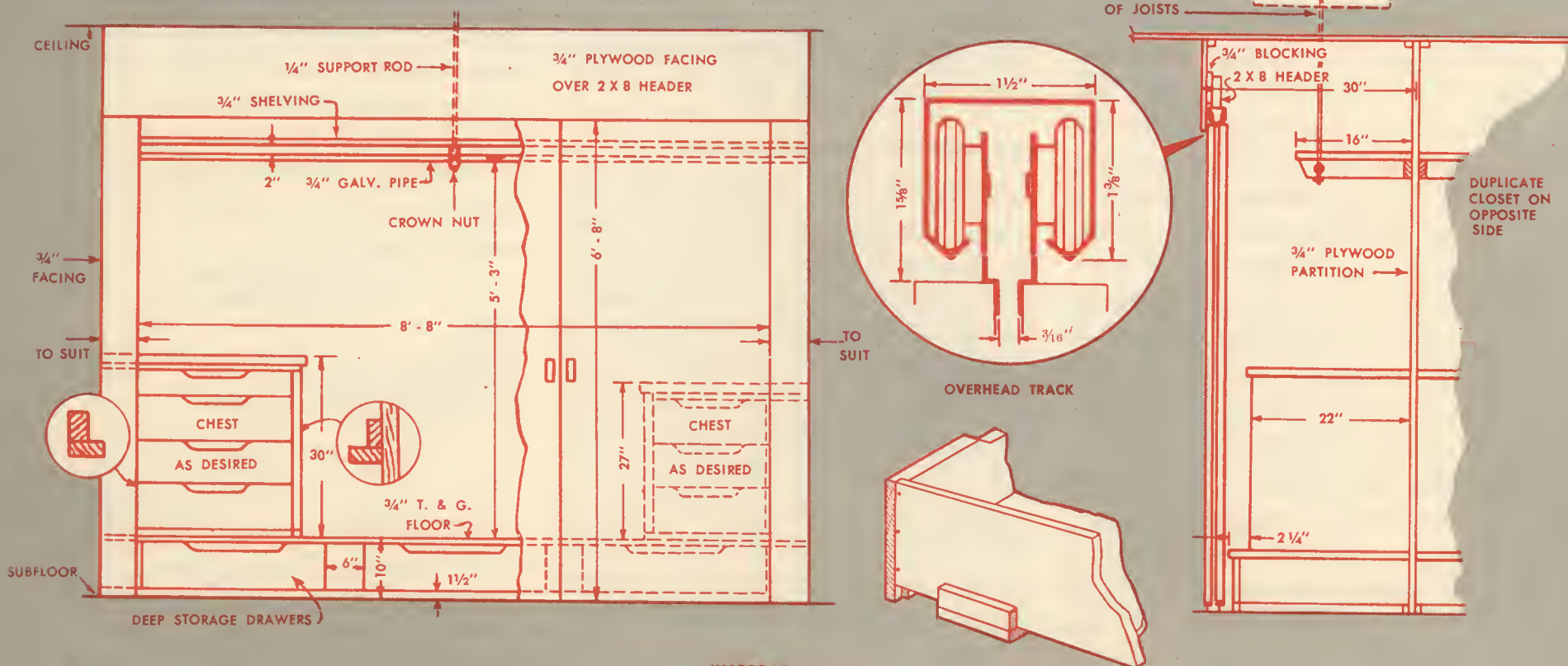
ISLAND-WALL LINEN CLOSETS

Construction details of the island-wall closet are given in an accompanying diagram. Note in the detail here and in the floor plan how this closet forms the partition wall of the hallway. The closet is completed first, then slid into place over the furnace return-air opening in the floor and screwed to the wall alongside. If you are using hardwood finish flooring, the

closet should be placed on top of the hardwood. With tiles or carpeting, it is placed on the $\frac{1}{4}$ -in. underlay, and the tile or carpeting is butted against it later.

The $\frac{3}{4}$ -in. plywood on the three exposed sides of the cabinet can be of the same wood you used for the walls alongside. It can also be of a contrasting wood—say of walnut, to complement the walnut wall of the living room. The two ex-

posed corners are mitered. The interior members are common plywood, and all the joints should be glued. The oak grill stock is available from any furnace dealer and is cut to fit the opening in the base. It is best screwed in place so as to be removable. The magnetic catches specified for the front-side doors are of the Leco-Latch type and are also recommended throughout the kitchen and utility-room



cabinets because of their smooth action and long-wearing qualities. For the large linen closet doors of this cabinet, heavier friction-type or locking latches should be used.

Note that, besides containing the Lumiline fixtures, the light trough on top of the cabinet is an excellent spot to locate your doorbell. Also, if desired, metal troughs or low flower pots can be placed around the edge of the trough to utilize it as a planter for ivy or other decorative plantings.

BATHROOM CABINET

The ranch house has a modern cabinet that will definitely glamorize your bathroom at low cost and also give you a truly adequate medicine cabinet. You can, of course, let any standard medicine cabinet

into the bathroom wall above the lavatory; but a good, mirrored medicine cabinet with any kind of built-in lights will cost considerably more than this birch cabinet and will not have its features.

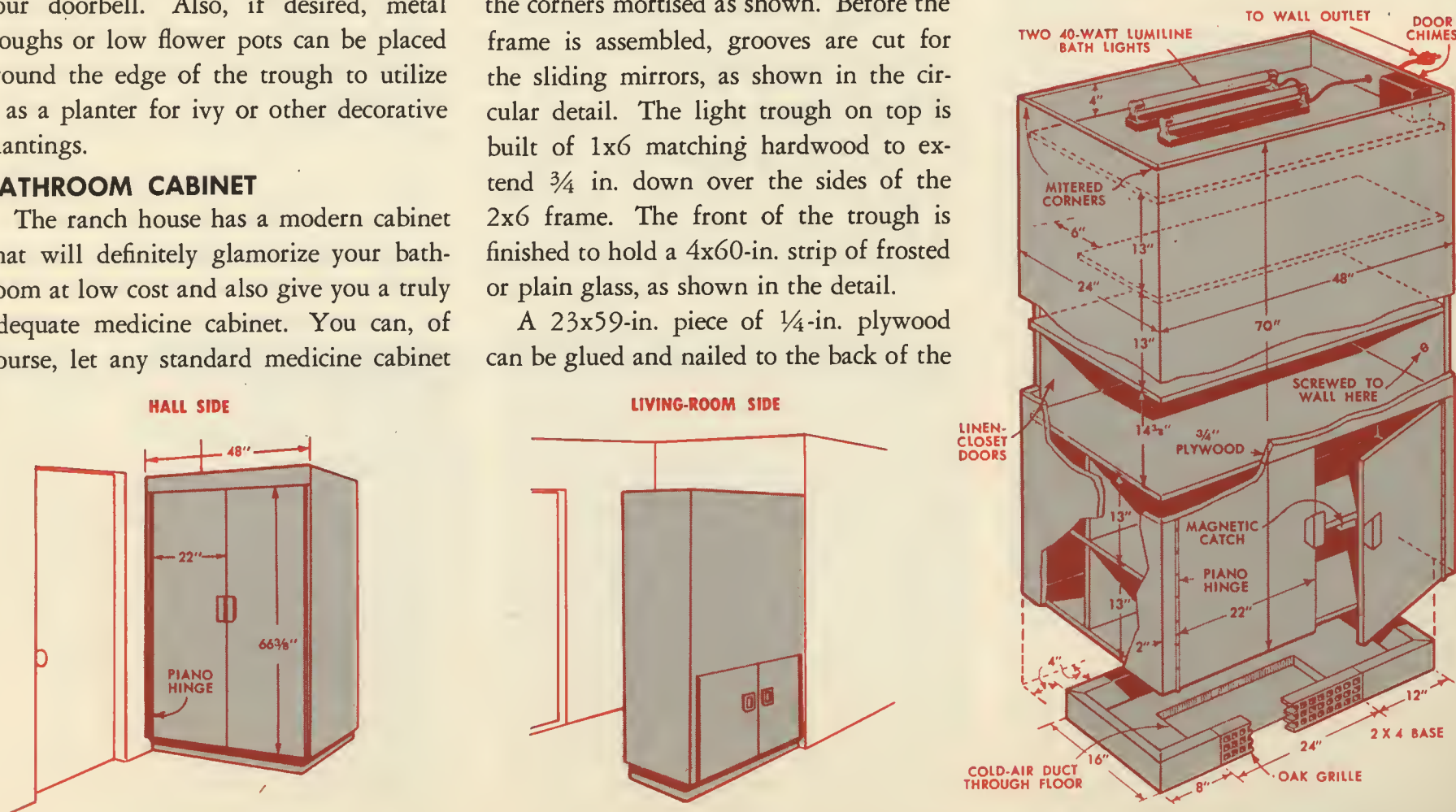
The cabinet is built like a picture frame. The frame is of 2x6 birch or other hardwood, 60 in. long and 24 in. high, with the corners mortised as shown. Before the frame is assembled, grooves are cut for the sliding mirrors, as shown in the circular detail. The light trough on top is built of 1x6 matching hardwood to extend $\frac{3}{4}$ in. down over the sides of the 2x6 frame. The front of the trough is finished to hold a 4x60-in. strip of frosted or plain glass, as shown in the detail.

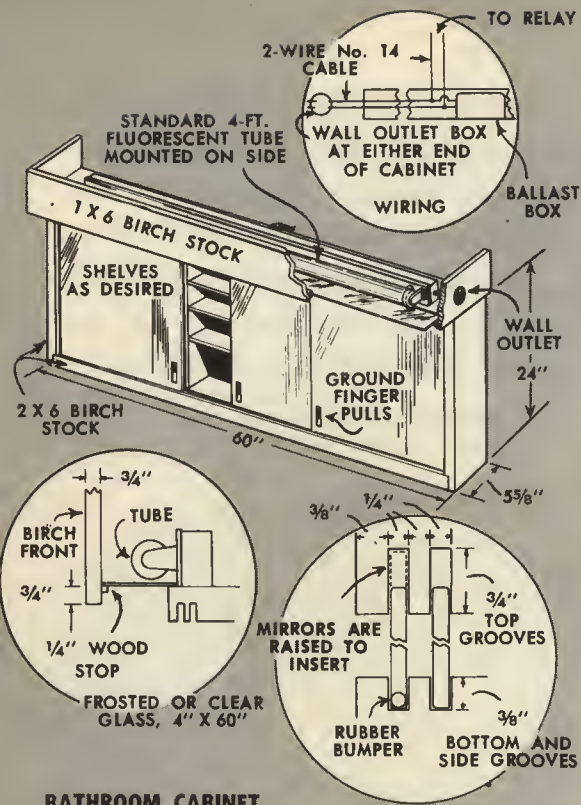
A 23x59-in. piece of $\frac{1}{4}$ -in. plywood can be glued and nailed to the back of the

2x6 frame, through which screws secure the cabinet to the wall. Or the cabinet can be hung directly to a plywood wall with small corner brackets.

The 4-ft. fluorescent tube is mounted on its side to give both close-up lighting through the glass strip and indirect light-

ISLAND-WALL LINEN CLOSET





BATHROOM CABINET

ing throughout the room from above. This is the same 40-watt tube that can be used in the valance boards. Note that sheathed cable is extended through a knock-out at the end of the tube box to a wall receptacle box in one end of the cabinet for your electric razor.

The three sliding mirrors for the doors should be ordered from your glass dealer after the cabinet is built and their exact size ascertained. These should be of 1/4-in.

thickness, with all edges rounded slightly and with ground finger pulls, as shown. The glass is fitted in the frame by simply pushing it to the top of the upper groove and then dropping it into the lower. Finally, obtain some erasers from the ends of common pencils and drop these into the bottom grooves to serve as cushions in preventing the mirrors from banging.

KITCHEN AND UTILITY- ROOM CABINETS

As already mentioned in the front of this book, the kitchen and utility room of the test house have been designed to give both modern efficiency and comfort to the average family. However, your needs and desires may vary; therefore these rooms have been kept highly adaptable. Two other kitchen arrangements are shown in the alternate plans, and the cabinet work throughout can be easily changed to fit other requirements you may have.

You might say that the cabinetwork shown on these pages is really two separate projects, that of the upper cabinets or cupboards which are built to line the walls, and that of the base cabinets which are built as storage units to fill the spaces between today's modern appliances. For this reason, the base cabinets of the test

house have been built of common plywood (plypanel) and are enameled white to give a pleasing horizontal line of white appliances and cabinets. The fronts of the upper cabinets have been built of 3/4-in. oak plywood, finished as limed oak by simply rubbing white lead into the grain and finishing with a coat of varnish. This definitely gives a luxury touch to your kitchen, and is highly recommended because only four 4x8 sheets of the oak is required for all these upper cabinets, including the hood over the furnace and the cabinet built in the brick recess alongside the nook.

All upper cabinets of the kitchen and utility room are built in the same manner. Drawings on page 103 fully detail the only complicated cabinets—those over the range and sink areas. On the other side of the kitchen and in the utility room, the cabinets are simple straight lines of cupboards as shown.

These upper cabinets are built entirely of 3/4-in. plywood, and the construction consists of only three basic steps. First, an open box is built on the floor as shown in the photos, and is hung to the wall and ceiling. Second, a 4-in. strip of 3/4-in. plywood is nailed to the front of the cupboard at the ceiling joint. If there is any irregularity in the ceiling, this strip is

planed to fit it. Third, the $\frac{3}{4}$ -in. plywood doors are cut and hung to complete the cabinet.

Thus, the doors are actually the whole front of the cabinet, excepting the one narrow strip above. This greatly simplifies the joinery required and gives a flush, modern treatment to your cabinets. The flush-pin hinge shown in the circular detail is the key to this construction.

A drawing on page 102 also shows the "Lazy Suzan," deservedly popular today, which is built in the corner near the range. Though you can build the "Lazy Suzan" yourself, it is much simpler to purchase

the basic unit, which consists of the metal shelves shown, the brackets for same and the pivot hinges for top and bottom. You simply fit two pieces of plywood to the front to match your other cabinets.

The area over the sink is boxed in by two pieces of plywood as shown. A flush-mounted light is centered in a hole in the bottom board. Note that two vertical partitions are left out of the shelving in the cupboard of Detail B, to give space for large platters there. In the test house, magnetic catches are used on all these upper cabinets and, on the limed oak doors, the "Spotlite" type of handle in a

coppered finish. These same modern knobs in satin bronze were used on the louver doors of the windows.

The upper cabinets of the utility room are higher than those of the kitchen to give clearance for a washing machine and deep freezer. Note that the space over the utility-room window is used as a storage cupboard—this can also be done in the kitchen, if desired.

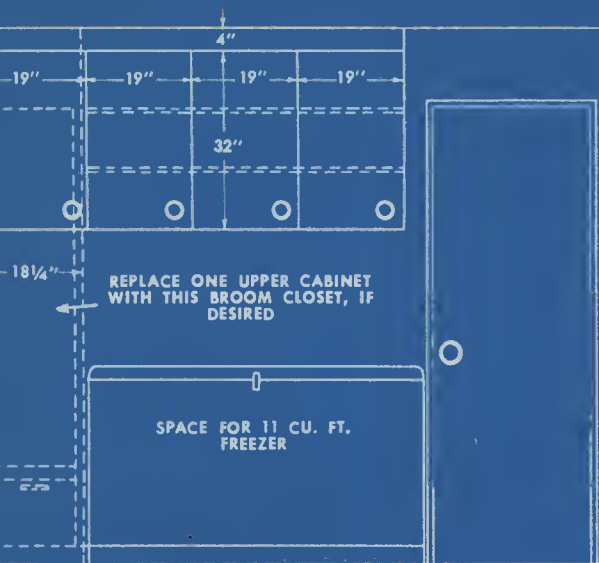
A drawing shows the detail of the base cabinet that is built to fit the space left between the kitchen sink and breakfast booth. Its sides, shelves, doors and top are $\frac{3}{4}$ -in. plypanel; the narrow pieces on

Kitchen upper cabinets are simple open boxes built of $\frac{3}{4}$ -in. plywood secured to the walls.

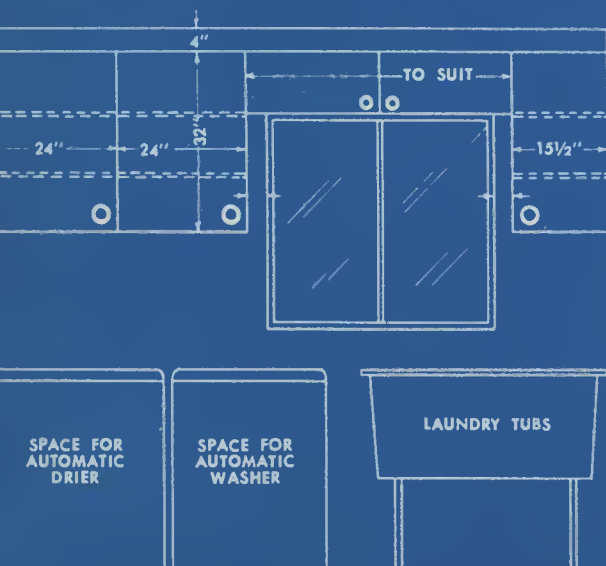
A 4-in. ceiling strip completes the cabinets. Note "Lazy Suzan" and sink lighting fixture.

New-type hinges simplify cabinet doors. A piece of matching plywood covers drawer inserts.

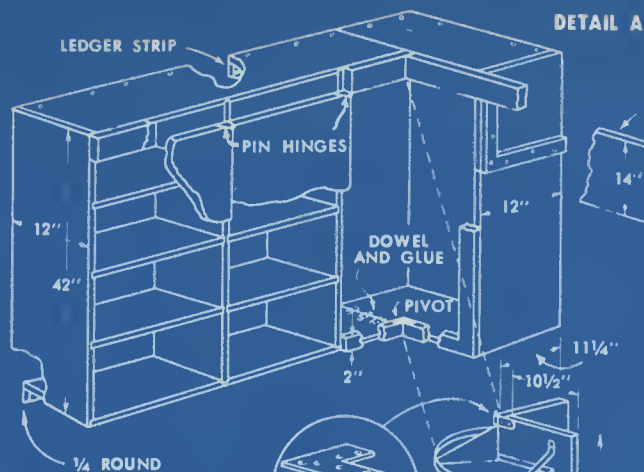




UTILITY ROOM — DEN SIDE



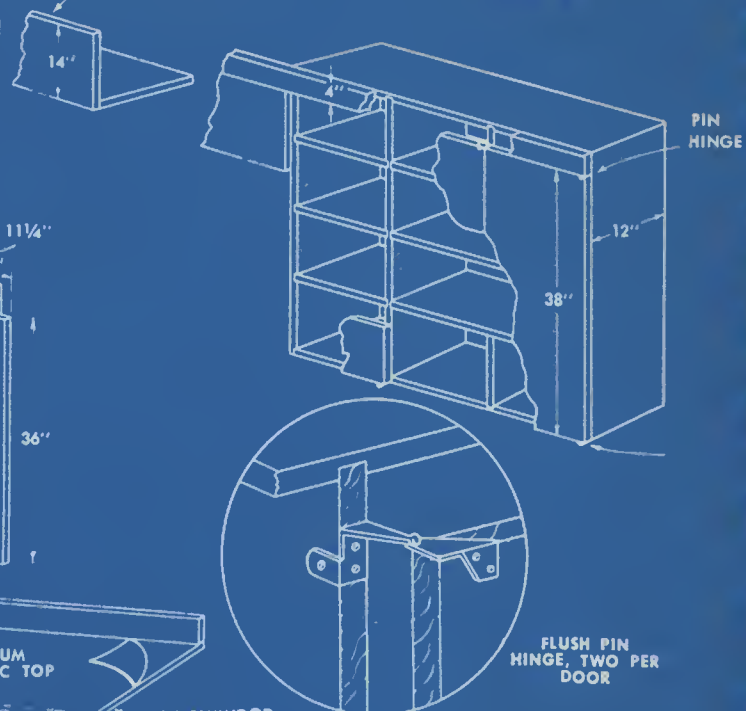
UTILITY ROOM — REAR SIDE



PIVOT HINGES AND METAL SHELVES OF "LAZY SUZAN" ARE PURCHASED READY-MADE

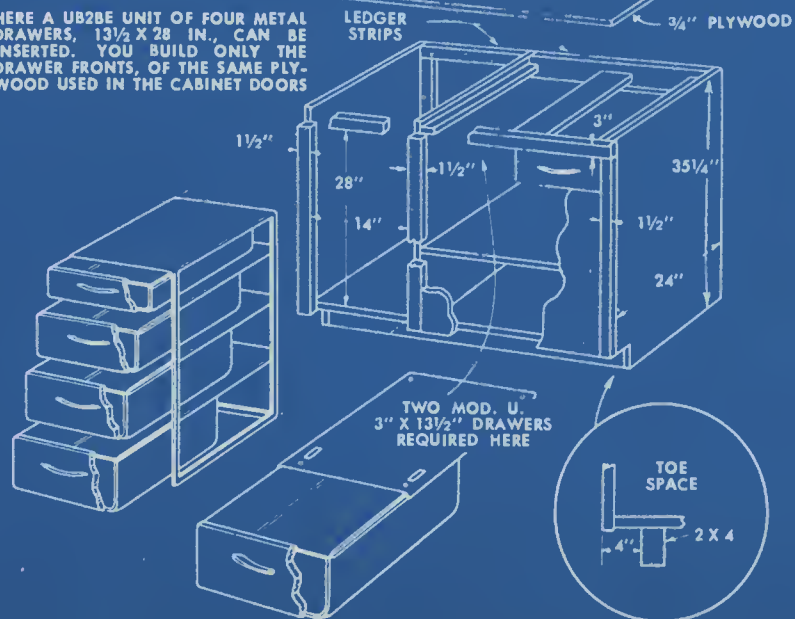
WINDOW BOX
PLACE A FLUSH LIGHT
FIXTURE IN BOTTOM)

DETAIL B

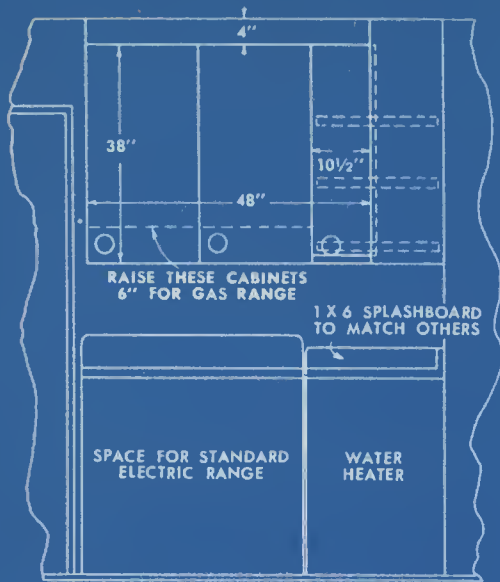


DETAIL C

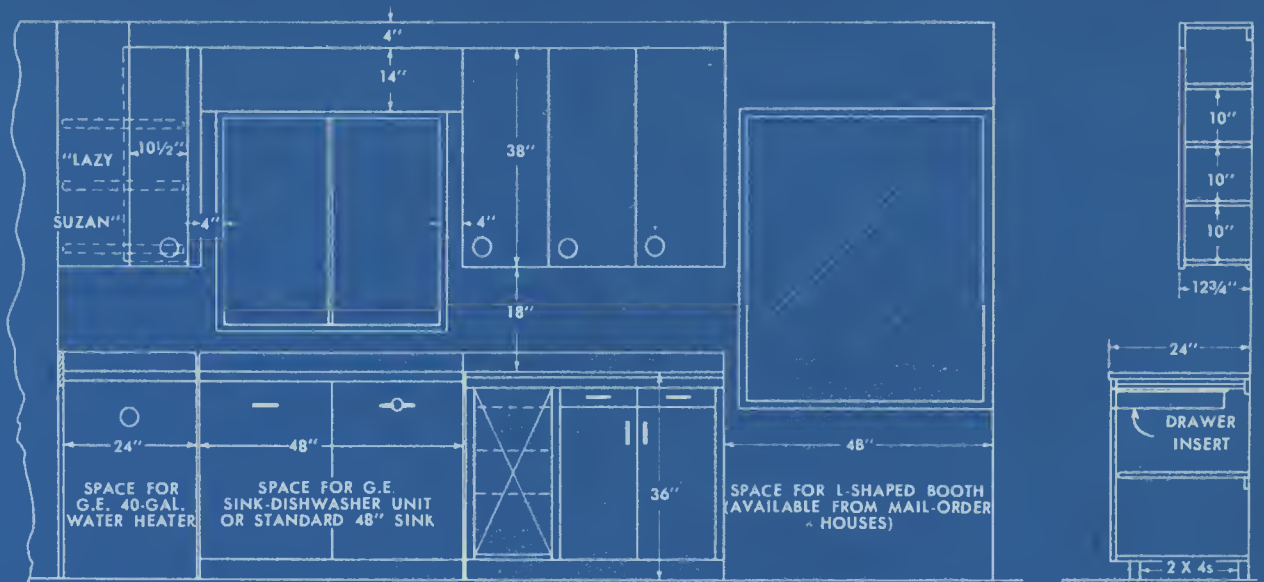
HERE A UB2BE UNIT OF FOUR METAL DRAWERS, 13 1/2 X 28 IN., CAN BE INSERTED. YOU BUILD ONLY THE DRAWER FRONTS, OF THE SAME PLYWOOD USED IN THE CABINET DOORS



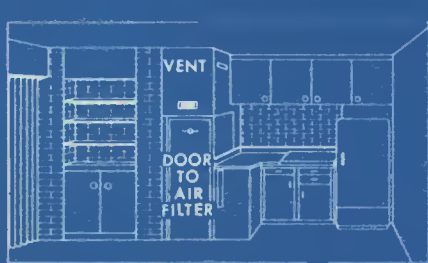
HERE IS A TYPICAL SINGLE METAL DRAWER INSERT, COMPLETE EXCEPT FOR WOOD FRONT AND HANDLE. NOTE THAT THESE DRAWERS SLIDE IN THEIR LIDS, WHICH ARE SECURED TO THE CABINETS BY SCREWS



KITCHEN — LEFT SIDE



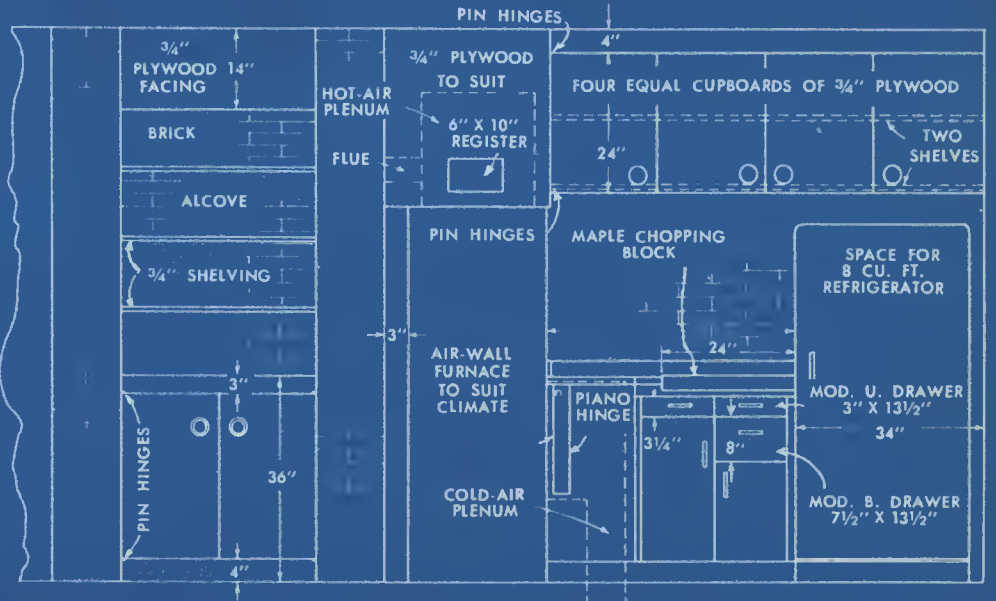
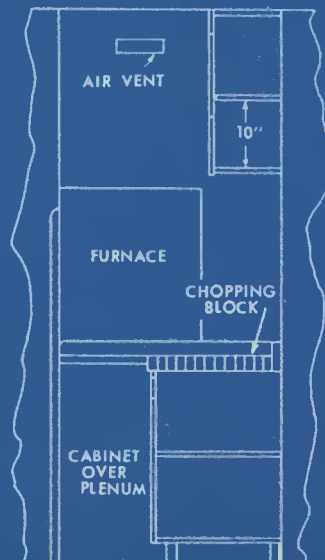
KITCHEN — REAR SIDE



KITCHEN — FIREPLACE SIDE



KITCHEN — REAR SIDE



KITCHEN — FIREPLACE SIDE



Simple what-not or china closet is built in the brick recess left in the masonry for this purpose.

the front can be of solid $\frac{3}{4}$ -in. stock. The cabinet is built first, then slid into place and secured. Note the simplified drawer construction shown by using metal drawer inserts. The four-drawer unit is slid into its opening and secured with a few screws; the single drawers are secured by screwing their lids to the cabinet above. You simply attach $\frac{3}{4}$ -in. plywood fronts to the drawers to complete them to match the rest of the cabinet.

On the opposite side of the kitchen, a similar cabinet is built and slid into the space left between the furnace and refrigerator. This cabinet will vary somewhat with the model of furnace you have chosen.



Base cabinet is slid into place beside furnace before fronts and chopping block are added.

Note on page 81 that it extends out alongside the furnace to cover the return-air plenum and to give an L-shaped counter here. A narrow door is cut in the front of this extension to give access to the furnace air filter. The photos on page 81 and drawings on page 103 show the construction of the $\frac{3}{4}$ -in. plywood hood over the furnace plenum. Note the vent slot on the side of the hood to allow air heated by the plenum to escape. This slot is covered by a metal louver such as are available for the fronts of sink cabinets.

Page 106 shows the maple chopping block that is placed in the counter alongside the refrigerator. The maple tops are



A 4-ft. space alongside cabinets accommodates L-shaped breakfast booth from mail-order house.

widely available today, already assembled in the 24-in. length shown; or you can glue your own together with 2x3 maple stock, placed on edge and secured by three $\frac{1}{4}$ -in. bolts through the width of the block. As shown, the block is best set at $\frac{1}{2}$ in. above the counter top. If secured by only a few screws from below, it can be removed for yearly resanding.

For a lasting job, the counter tops are best covered with one of the heat-resistant plastics. Linoleum or the plastic linoleums can also be used. The flush pin hinges, Lazy Suzan unit, Spotlite handles and drawer inserts, if not available from your local dealer, are obtainable from Wash-

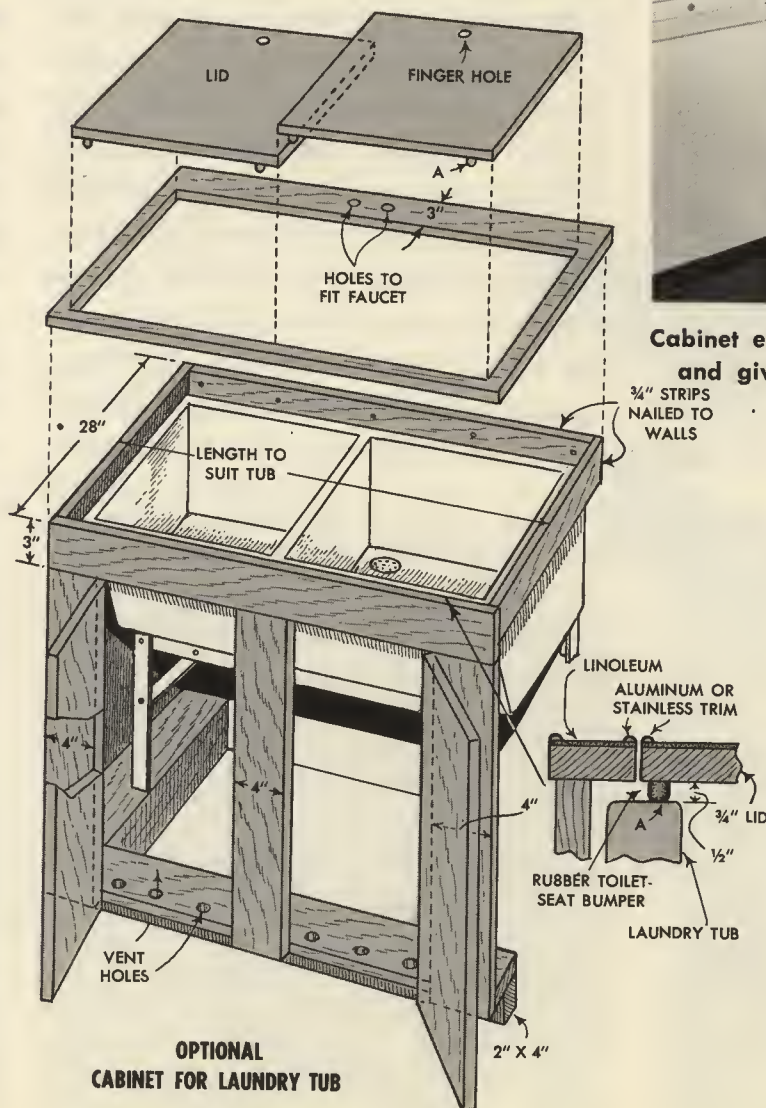
ington Steel Products Co., Tacoma, Wash. The L-shaped breakfast booth is available from Sears-Roebuck Co. or Plyline Mfg. Co., 5525 McKinley Ave., Los Angeles, Calif.

The cabinet enclosing the laundry tubs of the utility room hides that otherwise unsightly unit and also gives a good work counter in the room. In the cabinet detail at the right, note that the top of the cabinet does not rest on the top of the tubs but leaves a $\frac{1}{2}$ -in. space so that air can circulate to prevent condensation inside the cabinet in wintertime. The cabinet top is covered with linoleum or plastic and, best, the finish is run up the walls to window height, as shown in the photo. An alternate broom closet is shown on page 102 that can go alongside an 11-cu. ft. freezer in the room. This is a handy item for the vacuum cleaner and has a drawer below for cleaning supplies.

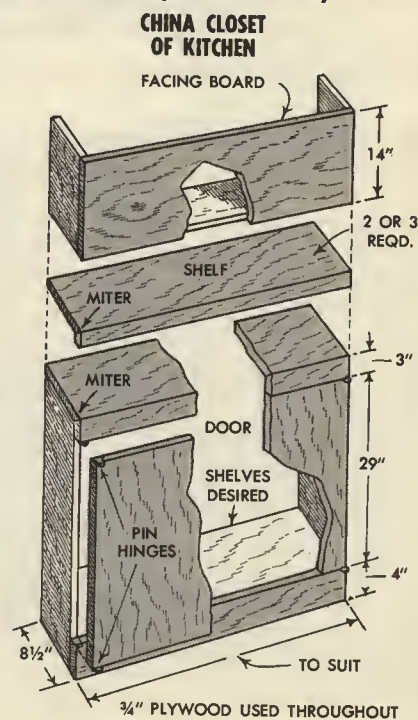
FLOORING

Have you noticed that the cork tile floor of the POPULAR MECHANICS house extends throughout every room? The finish flooring of your ranch house is entirely a matter of preference, but the overall cork floor is a feature of many modern homes to keep in mind—a durable, sound-

absorbing warm floor that is easy to clean and, extending throughout, gives the effect of a huge floor space. Asphalt, rubber or linoleum-plastic tile can also be used in this manner, but they should be carefully chosen as to color and design to



Cabinet encloses laundry tubs, hiding this unit and giving counter space in utility room.



prevent giving a "cold" appearance. If you wish to use wall-to-wall carpeting, there is no problem except that you will use linoleum or one of the tiles in the kitchen, bath and utility room.

Hardwood flooring also has been improved recently. Today you can use various prefinished hardwoods in boards and tiles that come already varnished. The boards are laid in the usual manner, and the tiles are laid similar to the cork. Either will eliminate the sanding and finishing that is necessary with ordinary hardwood stock.

With any of the above, the finish flooring is the last job in the house. Thus it will not be damaged by the other con-

struction. If you are using unfinished hardwood or softwood flooring, it can be laid any time after the walls are paneled and is sanded and finished at this time. Care must be taken not to nick it nor to drip paint on the unfinished wood.

The overall cork flooring is very easy to lay. The tiles are available with beveled or square edges in several sizes and thicknesses. The 12x12-in. Kencork tile in 5/16-in. thickness with square edges was used in the test house. Unless you have edge-blocked the 5/8-in. plyscord (as explained in the subflooring section) the first item is to nail an underlay of 1/4-in. plywood to the floors. Place the underlay panels crosswise to the subfloor panels and

nail them securely with flat-headed galvanized or underlay nails every 6 in. or less so that the floor cannot loosen. Fill any rough spots and wide joints with spackle or other filler.

No lining felt or further preparation of the floor is required. You now will need a linoleum knife, a notched trowel to use as a paste spreader and a 100 to 150-lb. linoleum roller. The roller can be rented by the day. An inexpensive home kit is available from Kencork dealers that contains the notched trowel, linoleum knife and other small tools for the job.

A drawing shows how loose tiles are squared to a room to start. These two cross-rows are set first; then the rectangles

Maple chopping block, purchased or self-made, is held by four screws, removable for cleaning.



Ventilated fruit and vegetable trays may be placed in opening of cabinet near refrigerator.



Cork flooring may be extended through all rooms of the house, giving effect of space.



left are filled in. Linoleum paste is spread with the trowel over about 6 to 8 sq. ft. of floor at a time, and the tiles are immediately set in the fresh adhesive.

There is a trick to measuring the cut for the border tile at a wall. The tile to be measured is centered over the next tile from the wall, and an extra tile is laid on top and butted to the wall to give you the cutoff line. Odd places such as the door trim are measured in the same manner. The cork tile has a "give" that will help you make a snug fit in such places, and another trick that flooring men use is to fill any small holes or cracks that are left with cork dust (obtained by sanding

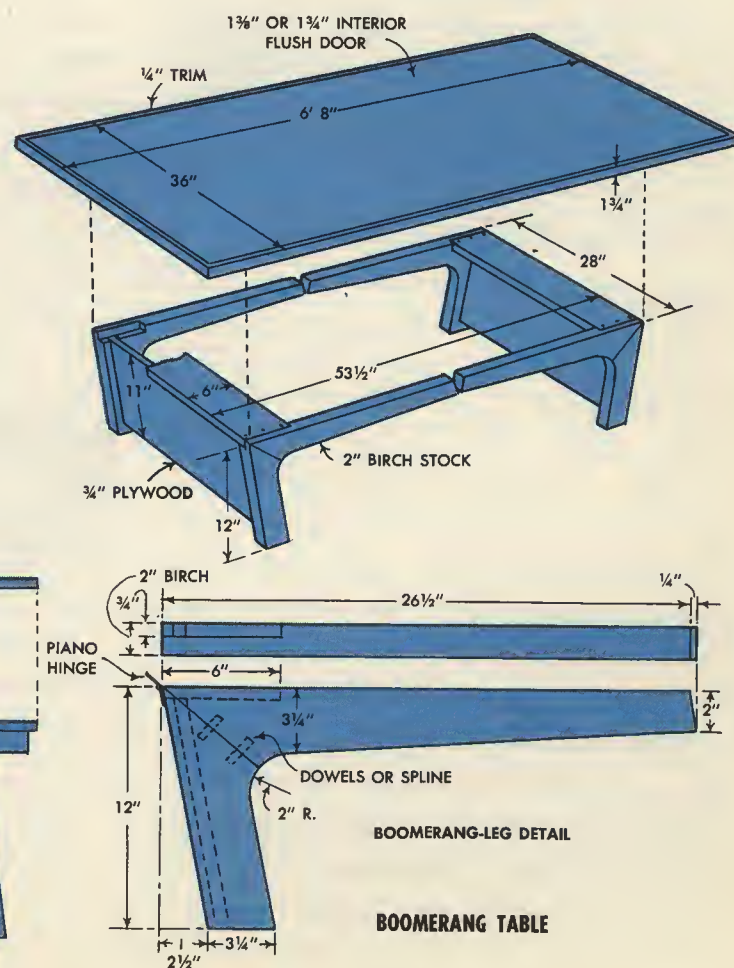
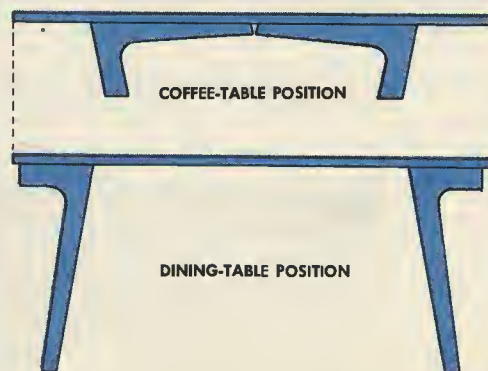
a scrap piece of the tile), mixed with floor wax. A section of the floor should be rolled with the heavy linoleum roller within a half hour after it has been laid. If you find a tile here and there that did not completely set in the adhesive, simply tack it down with small brads or the headless steel tacks made for the purpose. The "give" of the cork tile will hide the nail holes.

Any adhesive that works up through the joints while rolling should be wiped off immediately. Any that has hardened overnight can be removed with a rag soaked in alcohol. When the floor is completed, let it set for three days; then mop it

with warm water and a soft soap.

The $\frac{1}{4}$ -in. underlay is also used under the asphalt, rubber, linoleum-plastic and hardwood tiles and under wall-to-wall carpeting. With each of these, the manufacturer's specific directions should be followed, as each will vary somewhat.

The cork tiles are laid in linoleum adhesive, then pressed with 100 or 150-lb. linoleum roller.





Cork tile can be placed on one wall of room for dramatic modern effect. Door also is corked.

The inside corners of the baseboard are mitered, as shown, or butted together snugly. Outside corners are always mitered. The boards are butted against the door and large-window trimwork. You will notice that no baseboard is needed under the large louvered windows. With a snug fit of cork tile here, nothing is needed. With carpeting or hardwood, a quarter-round molding here finishes the joint.

The "sanitary" type of baseboard is usually preferable, because it has no ledge to collect dust. For the same reason, it is

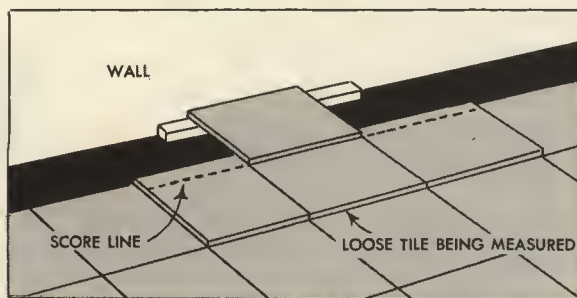
the best to use in the breezeway. In the kitchen, bathroom and utility room, the rubber or asphalt baseboard is used. This is available in black and several other colors and is simply cemented to the walls.

BATHTUB ENCLOSURE

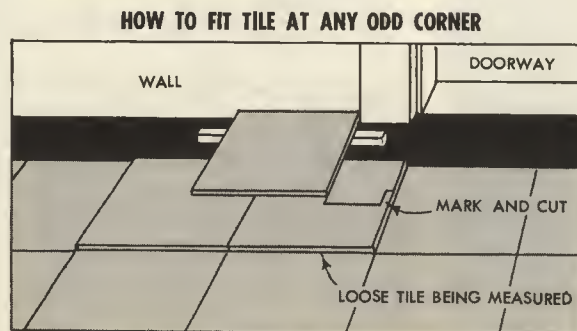
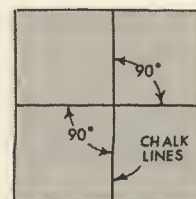
The bathtub enclosure shown on page 11 and given in the material list can be installed at this last moment—when there is less chance of breaking the glass. These standard 5-ft., glass enclosures have an adjustable aluminum trim on each side so that they can go across the bathtub and fit the wall on each side of the room, even

BASEBOARDS

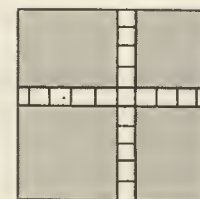
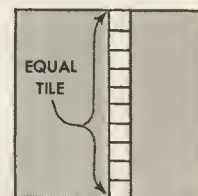
The baseboards are laid directly over the cork tiling or other flooring. Drawings on page 95 show two ways this can be done. The "sanitary" baseboard shown at the left is pushed down tight against the tile along the wall and is nailed to the wall. It should not be more than 3 in. in width, because a wider board will not bend to fit. The method shown at the right is better with such as hardwood, which may shrink. Any width baseboard can be used, and a quarter-round molding finishes the joint. Note that the quarter-round is secured to the subfloor, not the walls.



HOW TO FIT CORK TILE AT WALL BORDER



HOW TO FIT TILE AT ANY ODD CORNER



though you may have some slight variation in your walls. They are screwed to both walls and rest in seam compound on the edge of the bathtub. The type shown, with two sliding panels, is preferable because it gives easy access when cleaning the tub.

BOOMERANG TABLE

The "boomerang" dining table described in the front of this book has proved so excellent in the test ranch house and is so simple to build that it is included here as a possible part of the construction.

As shown in the detail on page 107, it is transformed from a coffee table position to dining table height by simply raising the ends and swinging down the two pairs of legs. In both positions, the boomerang legs are off-centered; thus do not need locks or special fastenings to hold them in place.

The drawing gives the full construction details. The top is simply a flush interior door of birch or other hardwood. A standard 3 ft. by 6 ft. 8 in. size is used, and a 1/4-in. trim is placed on the edges.

The boomerang legs are built of 2-in. hardwood. As shown, you can glue and dowel the legs at the mitered joint, saving material; or you can cut them of one

solid piece. The pairs of assembled legs are secured to the underside of the top by 2 ft. lengths of piano hinge or by three hinges at each end. The completed table is varnished natural or stained to match other furniture.

OTHER FURNITURE

The "other furniture" is not a part of the construction but is an important point to you. When most of us build, we are rather "bent" by the time the furnishings are needed and, whether or not we already have furniture, we are nevertheless yearning for something new to put inside our new home. Therefore the rooms of the ranch house were carefully designed so that only a minimum of furniture is required. You can completely furnish the ranch house—well—for almost half what it would cost to furnish an older home, especially those requiring period furniture.

The Early American or the Modern style of furniture is probably the best for the ranch house, and you can intermix these two types—or either with pieces of period furniture—for a delightful informality in any room. You will find that it is actually better to furnish each room with only a minimum of furniture, not just for economy but because the built-ins

make many pieces unnecessary and the uncluttered rooms will seem much larger, be more comfortable and much easier to maintain.

With the keynote in informality of Early American or Modern, you can do the many clever little things of today that require only a minimum budget. Low-cost unlined cottons make excellent draperies for the living area, homespun or corduroy for the bedrooms—and these can be washed instead of cleaned. A grass rug is most inexpensive for the living room and blends in excellently with the brick and hardwood wall. The covering of sofa pillows can be inexpensive cotton throw rugs, wall decorations can be simple ivy plantings—such things can complete the furnishing of your new home without adding up to an excessive amount and will actually be easier to maintain.

Above all, do not be afraid of blending various pieces of furniture you already may have with the Early American or Modern styles. For what are these styles? Modern is the changing of various pieces to more practical construction and use—not a definite period grouping of furniture. The most bizarre modern chairs grouped around a traditional piano is good decorating today. Early American

is today's development from the pioneer days when home owners built maple furniture and mixed it with the period pieces brought over from the old country. So can you, and the result will accent comfort and informality.

Two items of the furnishings should be specifically explained. One is that a convenient feature of the modern louvered windows is obtained by hanging your draperies to the 2x6 sill at the bottom of

the glass, instead of to the floor. Thus the louver doors can be opened to give full ventilation, whether or not the draperies are pulled. This is especially convenient in the bedrooms.

The other is that you can install the drape-type screens on the fireplace without purchasing an expensive frame. Purchase screening only, one piece to fit the front opening, one piece for the side. The screens are hung on two 1/2-in. iron rods that are, in turn, hung by 1/4-in. bolts tapped and screwed into the 3 1/2 x 3 1/2-in. angle-iron support of the opening. The

screens slide out from the sides to meet at the corner post and are thus less obtrusive than those of outside frames. If desired, you can also tap and bolt a brass fireplace trim or hood to the front edge of the angle iron.

LANDSCAPING

The landscaping gives an item to putter with as time goes by. A paved driveway and lawn are the larger part. Whereas you can lay a concrete driveway yourself, many suburban homes today are using asphalt for the driveway and this was tried at the test house. If you are having the driveway done by others, the asphalt can usually be obtained for approximately half the cost of concrete. As shown, it was continued around the garage and out on the rear side of the test house to give a good walkway and patio area. The asphalt will not freeze or crack and, today, can be laid very smoothly and without stickiness.

Your lawn and shrubs will, of course, depend on the lay of your lot. By using a premixed seed, mulch and fertilizer, you can eliminate a good amount of the preparation required with the usual lawn planting.

This is a job you'll look forward to. Lawn gets good start with premixed seed, fertilizers.



BASEMENT ALTERNATE

As already discussed at the start of this book, you do not have to build the ranch house exactly as the test house was built—by no means!

For one thing there is the basement. Basements in the past were a necessity under any decent home, because of the furnace and its fuel supply. Today that is not true—a modern furnace can go along anywhere—but the basement still has its advantages. So does the one-level house. To try to help you decide on which you will prefer, both sides of the question are presented here.

There is a strong trend today toward the basementless house because of the greater convenience of living on one level. With adequate utility rooms and storage areas above ground, the wife needs no longer be relegated to the basement on washdays, away from the children, the front door, the phone. She needs no longer pack the heavy wet wash up stairways to the drying yard. She needs no longer run downstairs every time she needs something, and her upstairs workroom obviously is more attractive. Also, the floor plan of a well-designed one-level home will give a convenient storage space on ground level for garden tools, bicycles and

the like. It gives less storage space than a basement, but it is handier and drier space. Also, there is no stairway—a major cause of home accidents. The construction of the ranch house, as so far described, incorporates these advantages.

On the other hand, a basement version will give you the most floor space for the money—the most square footage. If you wish a large party room below and a large hobby shop, a basement gives these the cheapest. If you do a large amount of home canning, the basement gives ample storage space that does not require heating to keep the jars from freezing. If you intend to heat with coal, a basement is a definite necessity.

From the construction standpoint, the one-level ranch house is the easiest to build. Also, it eliminates the damp basement if you must build on ground that has poor drainage. If you are building over rock, it is the only answer—cutting a basement through rock will cut a big hole through your pocketbook. One level is required for slab-floor construction, and it usually gives the easiest installation of the sewage system.

From the construction viewpoint, the basement is more practical if you live in a cold climate where foundation footings

have to be extended down 4 or 5 ft., anyway. The basement will give you the most floor space on a small lot. If you are building on a slope where the foundation wall on the low side extends up several feet, the basement is very little more trouble. And here it is ideal, because the lower side can have windows and a doorway at ground level.

As to cost—if you place the basement under the full-size ranch house, it will add \$500 to \$1000 to the cost of the house, depending on the cost of excavation and concrete in your locality. This is considerably more; but, if you have a large family and wish the most room, this is the least expensive way to have a four-bedroom home without losing storage and work space—you can build the breezeway and den as bedrooms and have a den or rumpus room in the basement. Also, you may not need the full-size ranch house over a basement. For instance, you can build the basement under the ranch house of the size shown on page 17, with a single garage and no breezeway. Thus, reduced, your house will cost approximately the same as the full ranch house built on one level—\$7500. Here the basement will add the rumpus room and—in square footage—will give more stor-

age space than the one-level house. For most families, this will be *less usable* space, because the breezeway, mud room and double garage are missing and the laundry area is below. So you can see that today the basement or not is today a matter entirely up to you. If the basement version is best for your lot, climate and needs, why certainly, build it!

The alternate basement floor plan is given on page 114, with all changes necessary from the foundation plan shown in the front of this book. Note that the overall dimensions of the basement vary slightly from those used for the crawl space. This is because the step-down wall construction of the one-level house gives a projection of concrete beyond the siding; and here in the basement version the walls extend down directly on the concrete, as shown in the detail.

Plywood forms, similar to the other, are best to use as they will give smooth basement walls. The basement walls do not have the pocket or step-down for the joists; therefore the floor of the house with a basement will be higher above lawn level than in the one-level version. This height is needed to give head-space and to give adequate sunlight into the basement windows.

The windows can be any size you desire to obtain, but are usually about 2x3 ft. in size. The simplest basement-window installation with either metal or wood sash is to hinge them from the top to swing inside and hook up out of the way under the floor joists. The basement plan shows a good placement of the windows, but you can vary this in any way needed to fit your particular lot. If there is a slope, and therefore one wall with considerable concrete exposed, try to plan larger windows on that side where they can admit more light without the necessity of digging deep window wells; and add an exterior basement door, if desired. Window wells—the corrugated-metal type are good—are usually the best answer for large windows on a flat lot without having your foundation walls too high.

Note in the basement plan that two metal I-beams replace the wood floor beams underneath the floor of the house. You can use the wood beams of the crawl-space version, but the I-beams are preferable because they require fewer upright supports, which tend to cut up the floor space of a basement. Note that the I-beams are set directly in the concrete walls and that concrete footings are poured around the pipe columns after they are in place.

The brick base of the island-wall fireplace here, of course, extends up from the basement floor. The same 12-in. footing is placed under the fireplace—it should never just rest on a basement floor. The furnace is placed, as shown, alongside the fireplace in the basement. Therefore, the flue lining in the chimney is extended on down into the basement through the reinforced hearth slab of the fireplace.

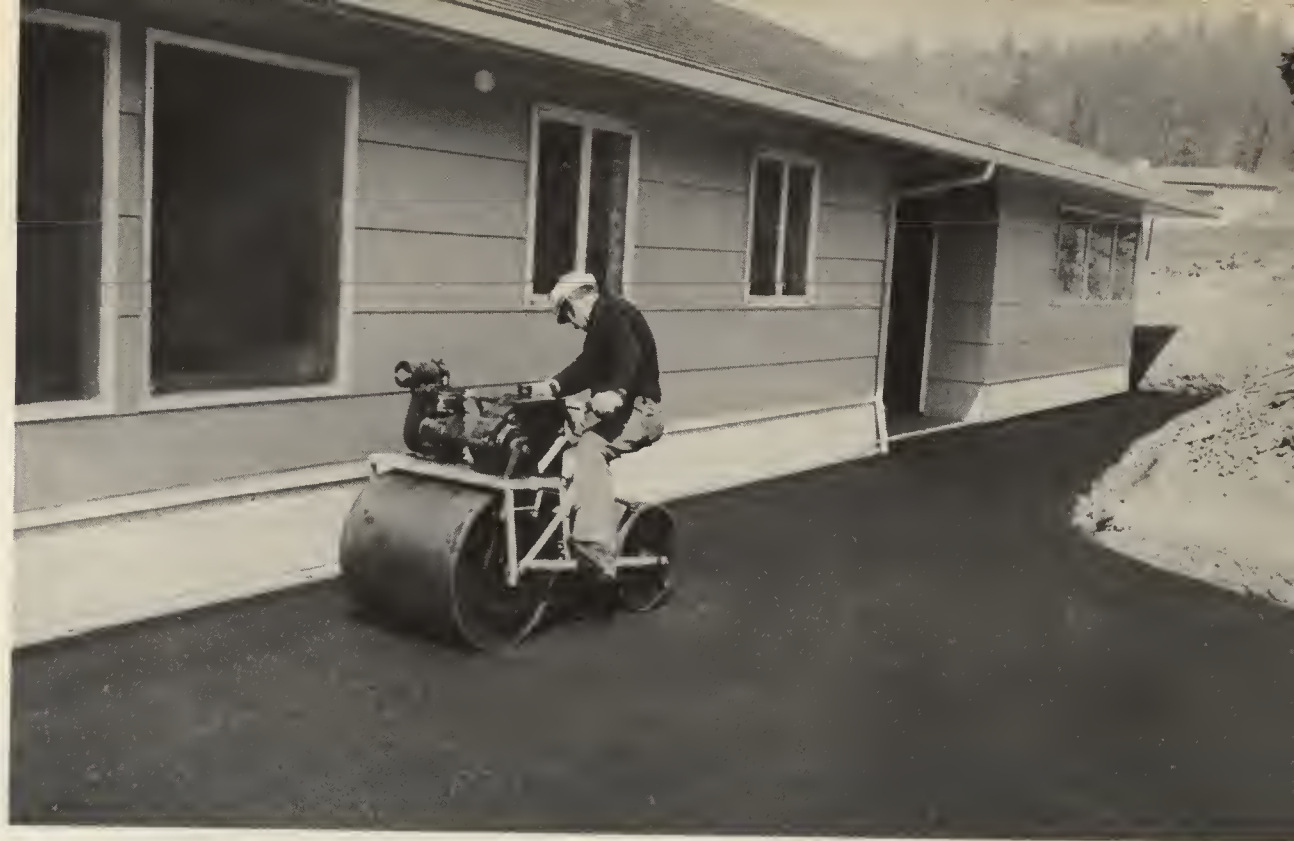
In the basement, the warm-air-duct pipes branch off from a short, squat plenum on top of the furnace. Such plenums are available from your dealer. The 7, 10 and 12-in. ducts of the furnace here should be rectangular ducts of equal capacity of the round—so as to be above head level. The small 4 and 5-in. ducts and the registers are installed as in the crawl space.

In the detail showing how to frame the floor joists for a stairway, note that the space for the deep freezer is not disturbed. --- a freezer located upstairs is much handier. The basement 4-in. concrete floor is poured in the same manner as the garage floor. First, of course, the footings and plumbing must be in place—usually the floor is poured near the completion of the house. The plumbing follows the same layout as with the crawl space, and the waste lines are placed below the basement

An asphalt driveway is cheaper than concrete, and will not crack or freeze in severest winters.

floor in similar shallow trenches. An $\frac{1}{8}$ th-bend is placed on the cleanouts to extend them through the floor. The water service lines are hung, as before, under the floor joists. The basement partition walls shown on page 114 are only a bare suggestion—you can partition off the basement in many ways for rumpus rooms, workshops and the like.

The electric wiring has been planned so that the basement can easily be included. To wire the basement for lights, you simply place ceiling outlet boxes between the joists, as shown on page 78, and wire these into the 15-amp. lighting circuit that feeds the wall receptacles of the living room, den and bedrooms above. A low-voltage relay in one of the ceiling outlet boxes can control the lights, or you can use pull-chain light fixtures. The 20-amp. appliance line of the utility room and kitchen is extended down into the basement to wall receptacle boxes for the washing machine, etc. The circuit for an electric clothes dryer is simply run down into the basement instead of into the utility room wall, and the same is done for the workshop circuit in the basement. With these wall receptacle boxes that will run



exposed down the concrete walls, electrical conduit or armored cable should be used instead of sheathed cable.

WARM-SLAB FLOORS

There is still another good way you can build the ranch-house foundations—with a warm-slab concrete floor on the ground, instead of the basement or crawl space. If you like the heated-slab construction, you can use either the so-called radiant-heat slab, with hot-water coils poured integrally with the concrete, or the

perimeter-heated slab with forced warm air.

For the radiant heat, it is recommended that you either have the concrete slab laid by experts or have your furnace dealer plan the heating system for you. A radiant-heat slab can be good, it can be poor, because the number of coils to use, their distribution and their placement depends considerably on the climate where you are building and the house's exposure to the weather. Therefore, you should have the system laid out by someone who knows the particular problems of your vicinity.

Also, the finish flooring you intend to use may make some difference, so this should be decided on before planning your slab.

The perimeter-heat slab is also best planned or installed by your local heating experts. In this method, warm air from a furnace is circulated through metal or tile ducts imbedded in the concrete. The duct-work completely encircles the slab close to its outer edge and the air is discharged into the rooms through registers below the larger windows. Thus, this ducting stops cold from entering at the edges and gives a "radiant-heat" slab. It eliminates

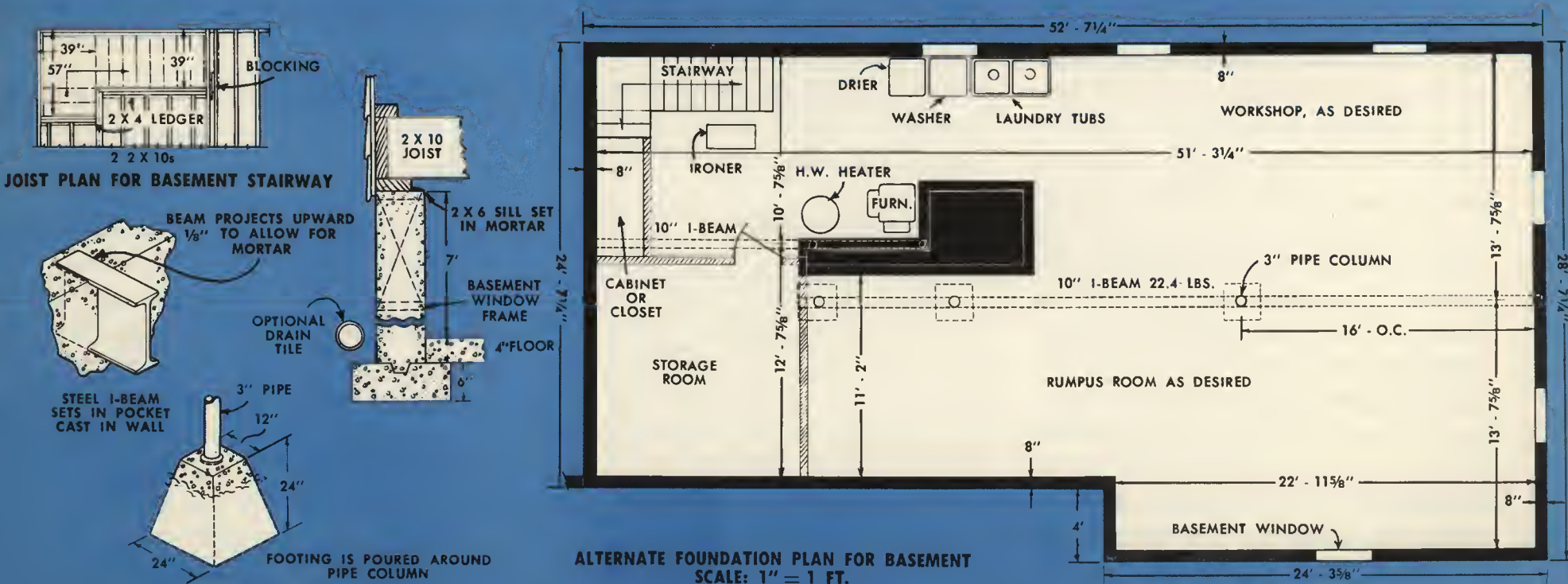
the objections to the true radiant-heat slab—the slow recovery of the slab to temperature changes and the lack of air circulation in wintertime.

For the perimeter-heat slab, the same Air-Wall furnace can be installed in the kitchen as with the normal ducting. A different furnace—the hot-water type—is necessary for the radiant-heat slab; but this will give no problem of installation. There are several hot-water furnaces available today using gas or oil that will look just as attractive in the kitchen location.

In fact, the various hot-water units take less space.

Whether you have the slab poured by experts or whether you have the plan made by your dealer and do it yourself, the slab should be made to the outer dimensions of the basement alternate plan. Thus, the stud walls of your house can be set on the perimeter of the slab as shown in the following prefabricated version. With the slab, the plumbing is placed as before—in this case, of course, at the beginning of the job and with traps and cleanouts accessible through the slab.

14



The wall-outlet wiring is simply run through the wall studs and ceilings instead of through floor joists, and the ceiling-light wiring remains as before.

ALTERNATE SIZES

How you can build the ranch house in a variety of smaller sizes, all by simply reducing its length from the garage end, has already been explained. There is no complication to this; the key, of course, being the fact that the hip roof over the end of the garage will fit anywhere on that end of the house.

Page 17 shows one shorter version of the ranch house—with a single garage and no breezeway. You can also build it with the double garage and *no* breezeway, or with the *single* garage *and* a breezeway. None of these alternates will affect the room placement inside the house, nor the plumbing and the like.

In a single garage, the garage windows should be reduced one section, or have three smaller windows. If the breezeway is omitted, the rear door of the house proper will open into the garage. Therefore, a door should be placed on the rear side of the garage to give easy access to the back yard. The mud room should either be eliminated or reduced in size to

give room for this door. If the mud room is retained, its entrance is placed inside the garage.

BASIC HOUSE

The basic house is yet another reduced version of the adaptable ranch house. It is the 52 ft. 7¼ in. length of the house proper. If your need is for immediate shelter, you can first build your new home to this size and then enlarge it at any later time without complication.

You can also build the house in this basic size to fit a small city lot or on a lot where you need a garage separate from the house to reach an alleyway. This smallest version of the ranch house will still give you a real home. It retains all the rooms of the house proper and, if you place the basement below, will give good storage space, too, on a small lot.

Where the house will not be enlarged later, the best architectural lines are obtained by ending the roof over the den and utility room with the garage hip, as shown on page 116. The only change necessary inside the house is to include an opening, or stairwell, framed in the utility-room ceiling, for access to the attic.

If you intend to enlarge the house later, the hip end of the room is not included

here. Instead, the roof ends with a simple gable, as shown on pages 16 and 17. Walls and roof can thus be easily continued on over the garage and breezeway, whenever desired, and the hip roof added at the end.

As already mentioned, this expansible construction eliminates any complication of carpentry, plumbing, wiring, heating and the like. You could, of course, build the garage end of the house first, live in that for a while and continue the house on toward the other end. But such always means temporary plumbing, wiring, heating, partitioning—all of which must be either removed or revamped when the house is expanded. These complications are not only expensive but often result in your never having the time to complete the expansion of the house. Such is not to be recommended.

Here you build the important rooms in the first plunge. Perhaps you may not complete the interior finishing at the start, but nothing will require alteration—you simply go ahead when you have the time and materials. As mentioned, the POPULAR MECHANICS house was first built in the basic size, then expanded, to fully test the simplicity of the expansion. Your author found this little, if any, more trou-



This version of the basic house is best for a small lot or where garage must meet an alleyway."

ble than building all the house at once. And he found this plan gives another great advantage—the basic house is completely livable during the expansion. There is no filling with shavings of rooms already completed.

For the expansible version, you have a choice of two ways to build the basic house. One is to complete all rooms in the house proper, as before, and to simply stop there with the gable room. This is the simplest and best, giving all the advantages mentioned above. The other is to also stop with the gable roof, but to use the den area temporarily as a carport. Although requiring some change when the house is expanded, this is advantageous

if you expect to spend several years before completing the breezeway and garage and wish to have shelter for the car in the meanwhile.

For either version, a drawing on page 117 shows how to frame the gable end of the roof. The gable is built of 2x4s with a $\frac{5}{8}$ -in. plyscord gusset at the top. Note in the circled detail how the vertical 2x4s are notched to receive the rafters. In the middle of the gable, a simple access door should be built to give access to the attic of the house. The gable can be covered with an exterior finish of any type you desire—a simple plyshield covering in a vertical board-and-batten treatment is good and inexpensive. Later, when the house is to be expanded, this gable covering can be removed or left where it is



Here is the basic house, first built with gable end, being expanded into the full 81-ft. size.

to serve as a firewall between the house proper and the garage.

For the carport version, the Wall S of the house is built as shown. Later, this wall is filled in with 2x4s on 16-in. centers to complete it as the normal Wall S of the den. The location of the carport is shown in the floor joist plan on pages 30 and 119. Only one partition wall—at the rear—is changed from the layout given in the studding plan of page 34. This rear partition is moved back as shown on page 119 to give you 17½ ft. of roofed length to the carport. The inside walls of the carport are best finished as the breezeway, with V-grooved plyshield that can later form interior walls of the den. The door-

ways of the den are framed in these walls, covered with the paneling and then cut out when needed with a skillsaw.

Foundation walls are required on all four sides of the carport. These foundations are poured of concrete only to the house sill level. The 4-in. building blocks are needed only on the interior walls of the carport—to form the step-down pocket enclosing the house's floor joists. Later, when expanding the house, these are simply knocked out and replaced on the outer walls; thus allowing you to place floor joists across the carport area to complete it as the den. The carport in the meanwhile is given only a gravel floor.

ROOM FLEXIBILITY

Most all of us have some special desire or need in the interior arrangement of our new home and here, with the blessing of a truss roof, any room alteration is very

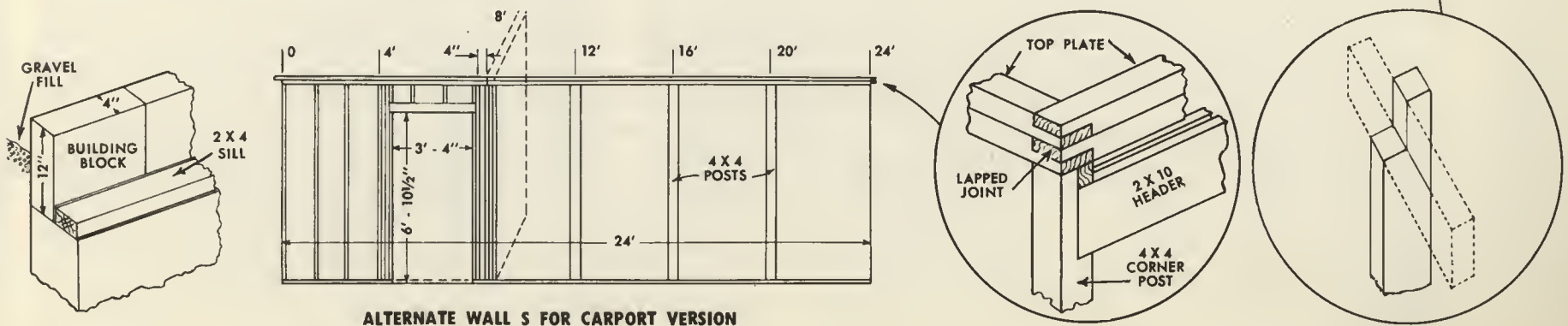
simple to make. As heretofore mentioned, most older roof construction requires support by both the exterior walls of a house and by certain interior partitions that are called bearing walls. The modern truss roofs require support only from the exterior walls—they “bridge” the width of the house; thus no complications develop in changing a partition wall to fit your particular desires.

For a specialized room, such as your personal den or a bedroom-study for another member of the family, the den area of the ranch house is probably the best to change. Your author chose the alternate

den arrangement illustrated on page 119 and found it excellent. Here the half-bath is included and also a compact complete darkroom for the photography fan.

The extra half-bath is highly recommended in any version of this end of the house, giving, as it does, the advantages of a two-bathroom home. As mentioned in the plumbing detail, its cost is only about \$150 when you build it yourself—for plumbing, fixtures, paneling, doors and all—and it can add \$500 to \$800 to the value of your completed home.

The half-bath wall framing does not require a 6-in. plumbing wall, as does the



main bathroom, because its plumbing needs only a 2-in. vent stack. It is framed of 2x4s on all sides. The two doors should be flush interior doors, 2 ft. by 6 ft. 8 in. in size, rather than the 2-ft. 6-in. door that is used here without the half-bath. Its wall paneling, of course, is as elsewhere.

You will notice that the darkroom plan has its sink directly behind the half-bath lavatory. This gives the simplest of plumbing for the darkroom. You will no doubt have your own desires for the cabinets in a darkroom—the plan here shows just one way they can be placed. It should also be mentioned here that you can place the darkroom across the enclosed front end of the breezeway, or in the mud room (with its door placed inside the garage), or in the basement if you decide to build the ranch house with basement. In any of these three cases, you should choose the darkroom location beforehand and place its plumbing in the ground before pouring the concrete floors.

Suggested on page 14 is a bedroom-study for the teen-ager or elderly member of the family who desires his bedroom a little more than just that. Here the half-bath is shown, placed closer to the rear door of the house than in the above version, and a wardrobe closet is built along-

side. Note that the accordion door of the den is replaced by a standard flush door, in this case serving as well as the more expensive accordion doors.

By using the den area as a bedroom and by enclosing the front half of the breezeway as an extra room, you actually can have here a four-bedroom ranch house with two separate sleeping areas. The separated sleeping areas are highly desirable in large families having older children or grandparents, especially so when the half-bath is included.

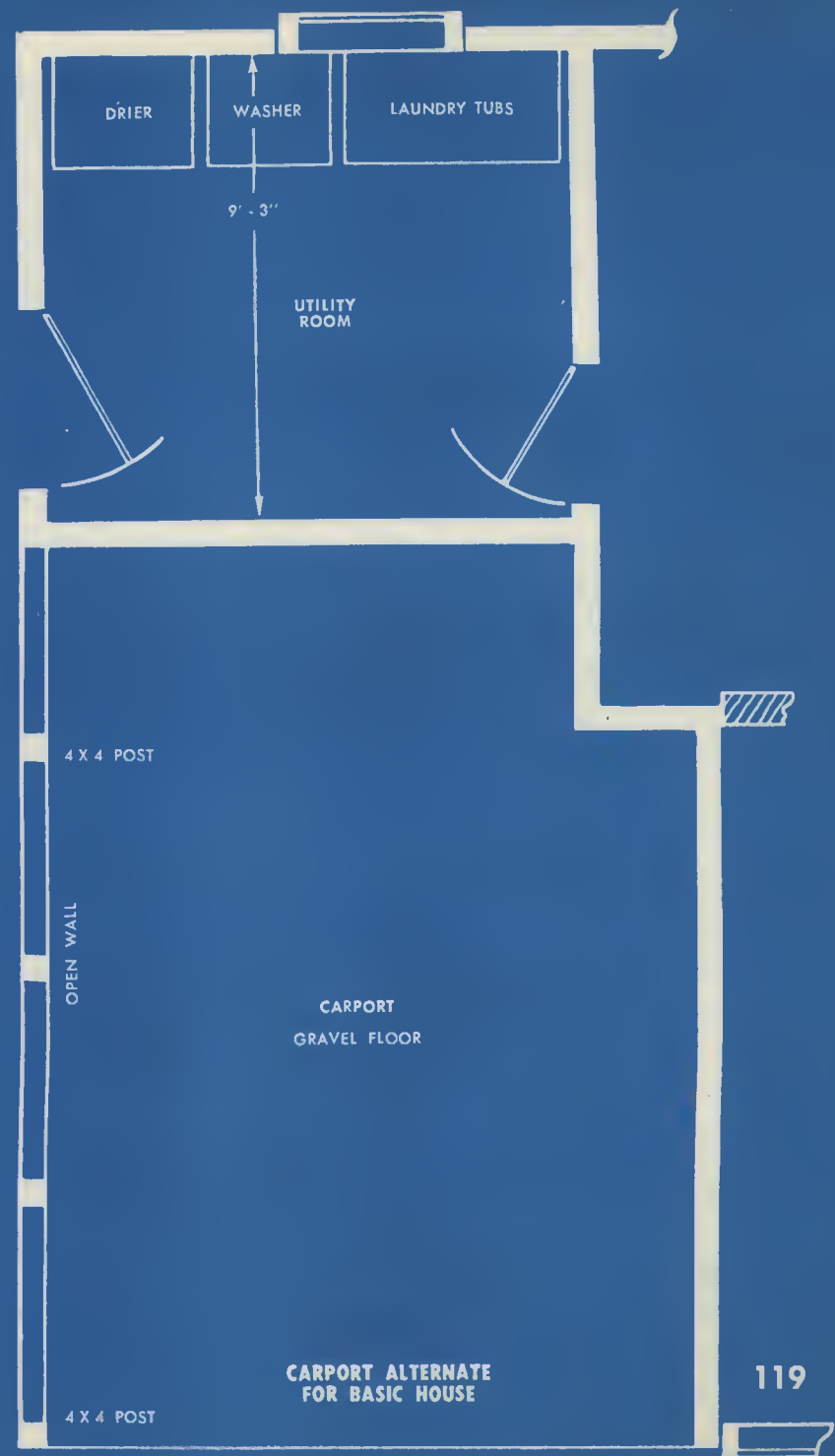
To enclose the breezeway as a room, its front wall is framed for windows. These can be two 4-ft. sections of louvered windows exactly like those alongside in the den and living room. They can also be two clerestory windows, built as in the other bedrooms. Either of these window types will be architecturally attractive here. The extra heating duct, shown in the heating plan for this room, is placed in the breezeway wall.

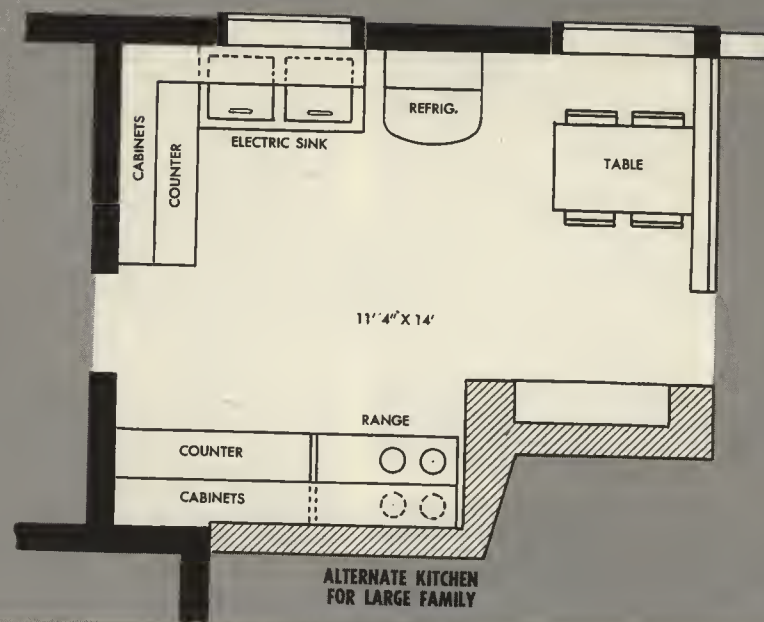
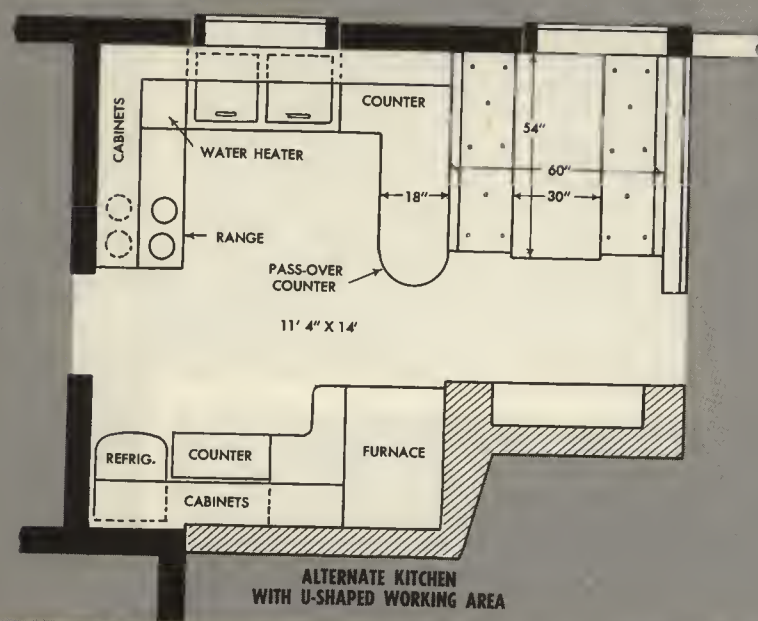
The breezeway is partitioned off in the middle, 12 or 14 ft. from the front end—where it will not affect the rear doors of the house and garage and will retain the rest of the breezeway for the rear of the house. The entrance to this extra bedroom can be in this partition wall, and windows

can also be placed here. One of the finest guest or boy's bedrooms that the author has ever seen was built in a ranch house in this manner, with its entrance into the breezeway as if it were an apartment of a motel. Thus, of course, the extra room can be framed in either during the house construction or at any time later. The door to this bedroom can also enter the den or utility room; in such cases it should be framed in during the house construction.

This will give you a room 8 ft. by 12 ft. or 14 ft. in size. If you wish a larger room here, add an exact 2 ft. or 4 ft. to the width of the breezeway, as shown in the floor plan of the ranch house. The breezeway can obviously be enclosed in the same manner for use as a sunroom, study or workshop; and all of these suggestions for the den-breezeway area can be juggled, varied, changed to fit your particular needs.

Because of the truss roof, you can also vary the living area and bedroom area as you wish. But here you should carefully plan out any major change so that you will not lose the traffic pattern, the open-planned living areas, the savings in hall space, masonry, plumbing and the like that the editors of POPULAR ME-





CHANICS MAGAZINE and architect John Whelan have so carefully designed into the house.

One item that may be preferable on some lots and some exposures is to have the front door of the house entering on the side of the 4-ft. front extension. This can be done without problem and without harm to the architecture by simply exchanging the vestibule and vestibule closet locations on the floor plan. A similar item that is practical in warm climates is to place French doors in the dining room

area or to replace one of these windows with a door that can lead outside to a patio in the rear yard.

The kitchen area of the ranch house is highly adaptable. Two alternate kitchen arrangements are illustrated on this page. One of these plans gives a kitchen that should be used only if you have built the basement below or are using a crawl-space furnace—the furnace must be below. This particular kitchen arrangement has been designed for a large family. The table space will accept a breakfast table for six

persons or more, and the counter space is extra large. This version is also recommended if you intend to use a coal or wood range—the range goes, as shown, in the brick recess and the counter alongside is reduced a foot in length to give an air space.

With a furnace below, you also, of course, can use either the other alternate arrangement shown or the kitchen shown in the main floor plan. The counters are simply enlarged to include the space left for the furnace.

BENCH-BUILD YOUR RANCH HOUSE IN THE BASEMENT

Time, more than any other factor, is probably the most critical item facing the man who attempts to build his home himself. The majority of us have a job, five days a week, eight hours a day; not too often can we obtain leave of absence in order to build our new homes on full time. You may have to build the ranch house on spare time, and thus, when you discount the time lost to bad weather and family necessities, you will be doing exceptionally well if you get your new home under cover during a normal building season.

Realizing that those who can devote their full time to building a home are comparatively few, the Crafts Editors of **POPULAR MECHANICS MAGAZINE** suggested to architect John J. Whelan that he keep the week-end carpenter in mind when planning the ranch house. Accordingly, John Whelan designed the ranch house so that a good part of it can be prefabricated indoors during the winter months to help save precious time on the building site. Starting out with the same floor plan of 4-ft. interior module that eases the normal dry-wall construction,

Whelan has designed the ranch house so that you can also build it by his new and highly practical "bench-build" method of prefabricated construction.

This does not require that you fully prefabricate a house—by no means! Full prefabrication means assembly-line production with expensive, complicated equipment and, frankly, full prefabrication has yet to be completely proven in house construction. The "bench-build" method is so practical because it allows you to prefabricate the walls by an ingeniously simple method. The walls are built in 4-ft. sections, complete with door frames and window frames. The truss roof of the ranch house allows you to prefabricate the major part of the roof. Thus, during the winter months, all these parts of your new home can be put together and stored until spring. With this much of your ranch house ready-built, early spring week-ends can be devoted to pouring the foundations and laying the subfloor in the same way as for the standard construction. Then, your summer vacation can be spent in setting the wall sections and roof trusses in place and completing the roof. In this way, you will have your ranch house fully enclosed and protected before cold weather arrives.



This "bench-build" system of prefabricating the walls has already been fully tested and used in ranch houses on the West Coast by professional contractors. It is today being used by the government for weather stations in arctic regions, where building time is also at a premium. It is of especial interest to the self-builder, be-

cause it requires no expensive tools nor equipment. Here you will use standard 4x8-ft. sheets of plywood, the same as you use for constructing the ranch house by the standard methods already described. Both the interior and exterior walls of the house can be prefabricated in these 4-ft. sections, standardized in size and shape to permit them to be mass-produced with common tools in your present garage or basement.

If you have read this far in this book, the prefabrication shown here of the ranch house will be very simple to comprehend. A study of the floor plan on page 123 should be made, and it should be compared with the regular floor plan of the house given on page 15 and with the studding plan given on page 34. For clarifying the similarity, the 4-ft. interior modules of the house are given as squared lines. Note that they are the same as the 4-ft. modules given in the studding plan for the standard construction.

You will notice here that some of the interior partition walls are not shown in solid black. These are the walls that you may change in various ways to fit the alternate versions of den, utility room and kitchen, and they can be simply framed in after the house is enclosed from the

weather. If desired, you can wait until the ceiling panels are in place—as with the nook's glass partition wall—before framing these partitions. The den-living room doorway is one of these, because you may wish it framed for an accordion door or for a standard 2 ft. 6 in. bedroom door.

The plan gives the various prefabricated wall sections that will be needed; these will fit any version of the ranch house. There are eight different sections, Nos. 6 and 9 detailing the opposite sides of the two solid sections. Only 69 wall sections are needed for the interior and exterior of the full-size ranch house; less, of course, for the reduced versions. You will note that the various types are keyed to the floor plan to show where each section is used.

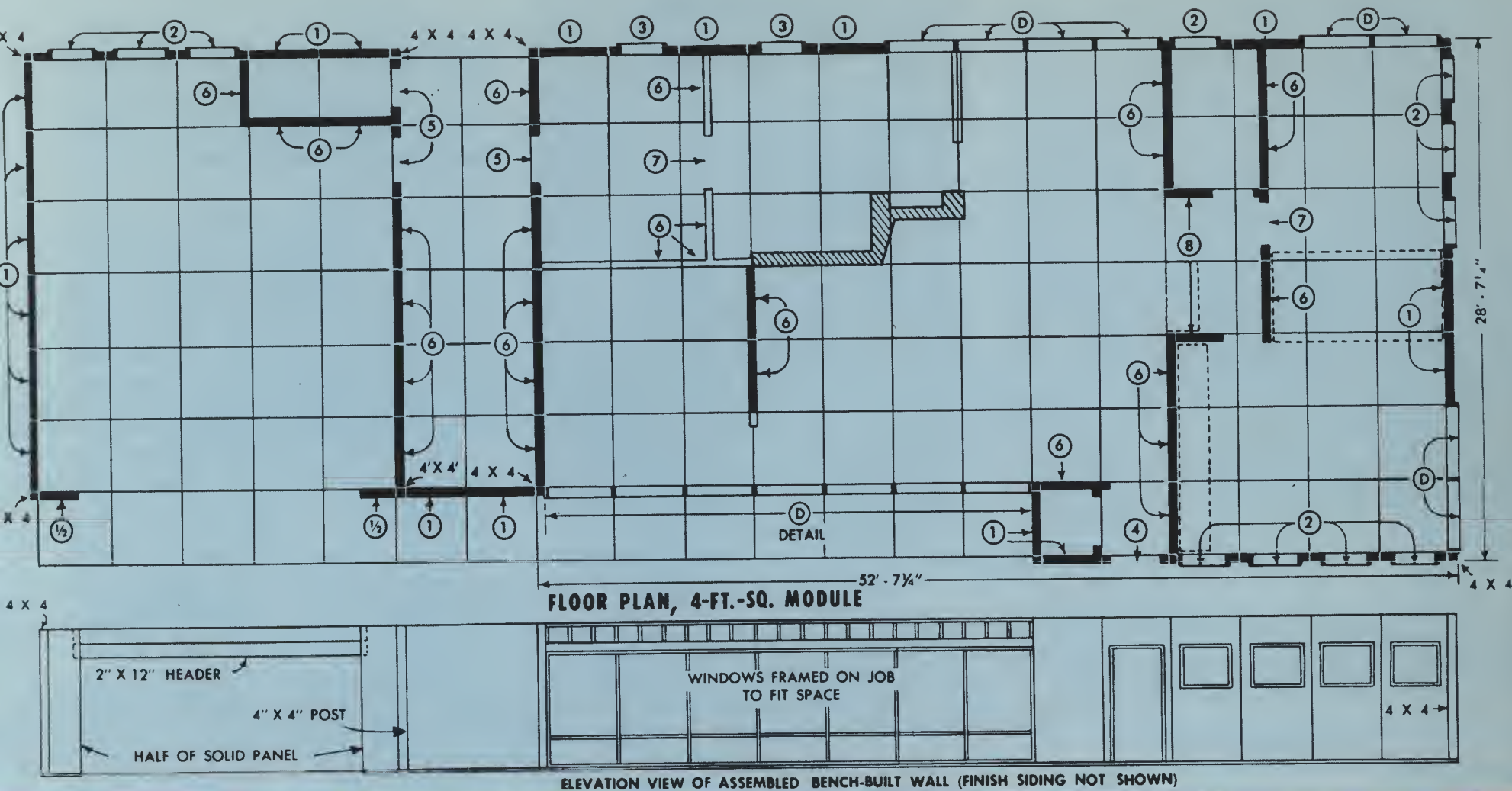
Another drawing gives an example of how the front wall of the ranch house is assembled with these prefabricated sections. Four No. 2 sections form the bedroom window area. One No. 4 section forms the front doorway. Two solid No. 1 sections form the front and side of the vestibule closet, and two more No. 1 sections enclose the breezeway.

For clarity, the open framework that is left in the top of the exterior wall sections for the roof overhang is not shown

in the elevation view. Note the similar framing and headers shown over the louvered windows. At the site you can rapidly frame in these headers and the window frames themselves to fit the spaces left in the prefabricated walls; therefore it is not necessary to prefabricate them beforehand. However, you can prefabricate the window frames, if you so desire. Page 124 shows how they are erected at the job, first placing the wall sections and then the prefabricated window frames, then filling in with the headers above. The garage entranceway is usually framed in at the site, too, with studs, cripples and the 2x12 header, as shown in the standard construction; or here you can prefabricate two half-sections of wall No. 1 with cripples to receive the 2x12-in. header.

The prefabrication floor plan details how the other exterior walls are erected in the same manner, by using the prefabricated sections as shown. Note the corner posts at all exterior corners of the house and garage. These are 4x4s (3 $\frac{5}{8}$ in. by 3 $\frac{5}{8}$ in. common lumber) to which the wall sections are spiked, keeping the house on its interior module and simplifying corner construction with the prefabricated sections.

The wall sections are secured by simply



spiking their sole plates to the subfloor and spiking their outside studs together and to the corner posts.

You have a choice of two different ways of prefabricating the "bench-build" wall sections, depending on the exterior finish you may want to use. The lower detail

shows how the walls can be prefabricated with the sheathing only in place. Here you will build the wall sections with 5/16-in. plyscord sheathing, used in its full 4-ft. width. The walls are erected by spiking the sections together and later are finished by covering the sheathed sections with any siding you desire. This "sheathed-

panel" method should be used with the lapped-plywood siding, with shakes, clapboard and any other horizontally applied siding.

The upper detail shows how you can fully prefabricate the walls of the ranch house with finish exterior siding placed on the wall sections before bringing them



Trusses for the prefabricated ranch house are the same as those for the standard construction.



Prefabricated window frames are set in place alongside wall sections and headers fitted at site.

to the site. Here a 1½-in. strip of the 5/16-in. plyscord sheathing is ripped from each 4-ft. panel and saved. The plywood panels are then nailed to the 4-ft. wide frames of the wall sections with a ¾-in. space left on each side, as shown. Then the finish siding is nailed to the prefabricated section—to the full 4-ft. width of the section. As shown in the detail, these finished wall sections are assembled by slipping in the waste strip of 5/16-in. plyscord to form a key or weatherstrip at the joint. Usually, builders also run a line of seam compound in this joint with a

caulking gun to further prevent water from entering the wall.

This fully prefabricated exterior wall necessitates your using a vertical-board treatment for your finish siding. Exterior plywood (plyshield) is the easiest to use for this, and it can be further covered at the joint by using the board-and-batten treatment shown on page 16, with battens over the wall section joints and every 16 inches in between. Another treatment in use by contractors on the West Coast is 1x8 tongue-and-groove redwood or similar finish siding placed vertically. This

requires your ordering the finish siding rerun by a mill so that seven of these 1x8 (approximately 7½-in. wide) boards placed together will be exactly 48 in. in width.

You will have no problem with framing these wall sections alike, because of the plyscord sheathing being used that is exactly 48 in. in width. The framing of these wall sections is of equal strength to those walls built by standard construction. The 2x4 studs are on 16-in. centers, and in the exterior wall sections the upper blocking between the studs is placed exactly the same as the soffit headers of the standard method and serves the same purpose—to receive the framing members of the roof overhang. Over any window or door opening in a wall section, this blocking is doubled to serve as a window header. Nailing of the 2x4s is with 16d common or box nails, and the 5/16-in. sheathing is secured with 6d common or box, spaced 5 in. along the edges and 10 in. on intermediate studs.

A second top plate is placed on the assembled walls before the roof trusses are erected, as shown on page 126. This top plate is the same as that used in the standard construction heretofore described, and the butted ends of these 2x4s, as before,

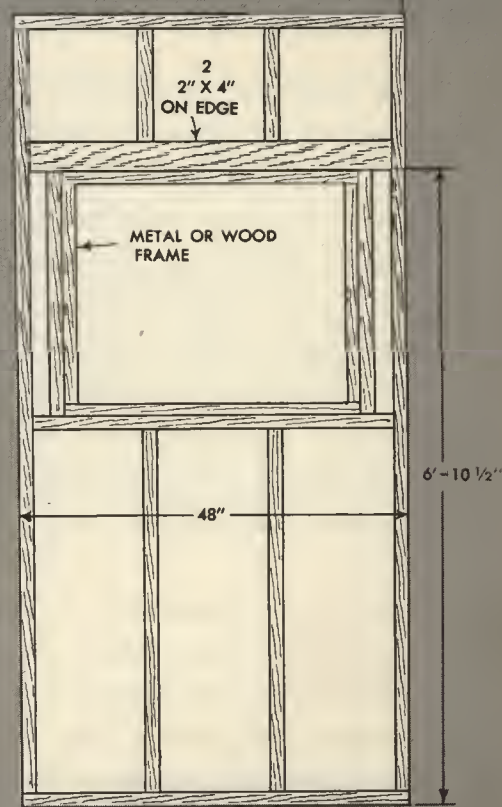
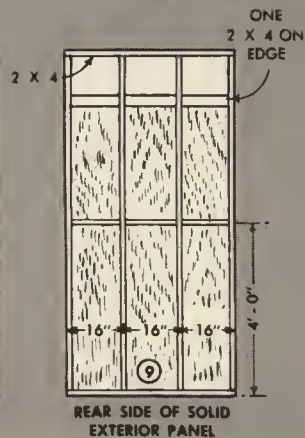
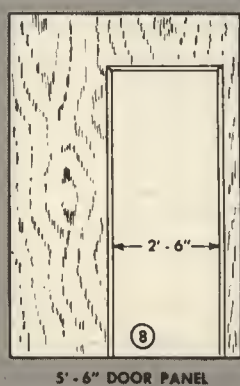
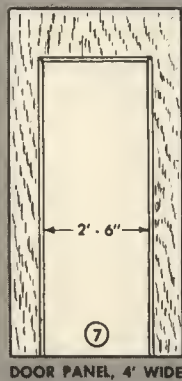
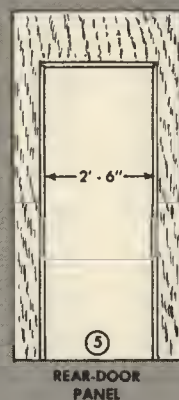
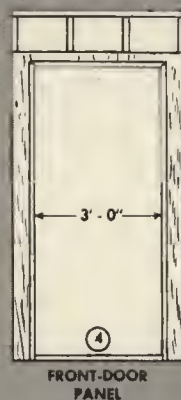
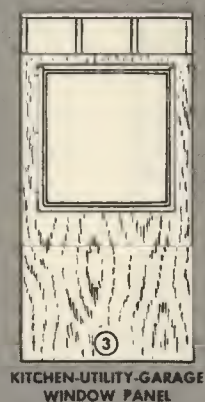
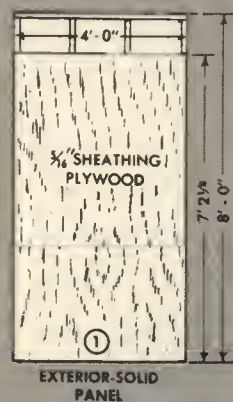
should not be placed at the same spot on the wall as the joints of the plates below.

The doubled top plate extends across the interior-wall partitions. On these interior walls, the plyscord sheathing—which will be on one side or the other of the wall section—is used as the underlay of the double-panel method of finishing an interior wall that has been explained in the wall paneling section. If instead

you wish to use a single-thickness, $\frac{3}{8}$ -in. paneling throughout the prefabricated ranch house, you can just frame these interior wall sections with 2x4s and temporarily brace them with diagonal pieces of scrap lumber. As already mentioned, the utility room and den partition walls can be framed in later to fit any version desired. Wall section No. 8, for the doorways of the bathroom and master bedroom,

is built 5 ft. 6 in. in width instead of 4 ft. to give the necessary width to the bathroom. At the front vestibule entranceway, a 2x6 header is framed in overhead as in the standard construction.

The prefabricated roof trusses are built exactly as those shown for the ranch house built on the spot. They can be completely assembled and stored outdoors without harm until ready to be used. It is best to





John J. Whalen, architect and father of the "bench-build" plan, explains to Tom Riley how the test house could have been built with the prefabricated panels. Studs would be doubled every 4 ft., at the edge of each section; otherwise the wall construction would be the same.

stack them and cover with a tarpaulin or a layer of tar paper. If limited space at your present residence does not allow this, at least the various parts of the trusses can be precut, ready to be assembled at the site.

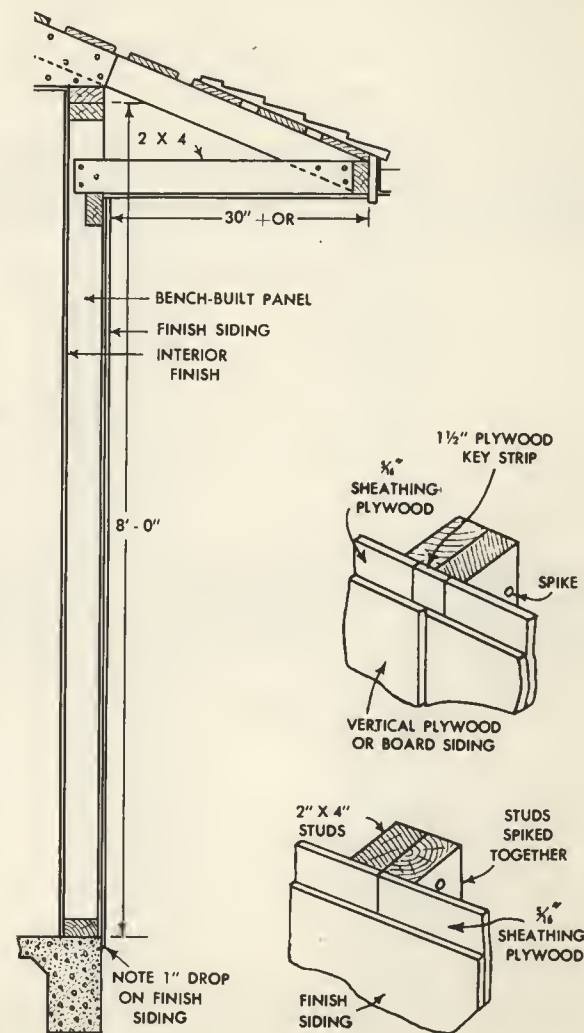
When the trusses are erected over the walls and the roof is being covered, the 2x4 crosspieces of the soffit are installed as with the site-built ranch house. Then, installing the windows and doors will completely enclose the house against the weather.

As already mentioned, the larger windows of the ranch house are ordinarily built to fit the openings left after the prefabricated walls are erected. This has the advantage of not requiring an exact fit or careful handling, and does not require a

flat-bed truck to haul them to the site. The plan on page 123 shows the den-living room windows built in one frame, not as two separate frames, and the dining-room nook windows built the same. This is an alternate way of framing in these window areas to that used in the standard construction. You can use either method—it is a matter of appearance. With this alternate method, the den doorway should have an accordion door so that it can close directly on the window frame. The 6-in. nook partition wall is butted to that window frame, using a clear 2x6 piece of lumber at the joint.

The smaller windows—the bedroom clerestory windows, the bathroom window and the kitchen and utility-room windows—are built to fit inside the wall sections. A drawing on page 123 shows how the bedroom clerestory windows will look; in this prefabricated construction they are treated as separate windows, not as a length of several windows in one frame. Another drawing (page 125) shows how

they can be framed with clear 2x6s to match the framework of the larger windows of the house. For such, the 2x6 frames are mortised at the corners and on the outer edge to receive 1 3/8-in. wood sash, as given in the window detail of the



standard construction. Or here you can frame in metal windows, of a single-pane, top-hinged frame, similar otherwise to those already shown for the kitchen and utility rooms; or you can use the type complete with metal frame, sill and outside trim. Whichever type of window you chose here should be obtained beforehand so that there is no mistake in framing in their openings in the wall sections.

Here in the prefabricated version of the ranch house, the bathroom window is the same as whichever window you chose to use for the bedroom clerestory windows.

The kitchen and utility-room windows can be framed in as done in the standard construction, or here again you can use the metal-frame type that is complete with outside trim and sill. Of course, they should be of the casement design, with both sides opening, to give good ventilation in these rooms. All of these smaller windows can be set in their wall sections for an exact fit, but their panes, if already installed, should be removed before trans-

porting the wall sections to the site to prevent breakage in transit or when assembling the walls.

The frames of the exterior doors are also installed while you are prefabricating those sections and are built of 2x6 material, exactly as with standard construction. They should be given an exact 3-ft. opening, as shown. The interior-partition-wall doorways can be completed with the door frame, or these wall sections can be left with the rough opening. While prefabricating them in your basement, all the wall sections that contain doors or windows can be given the same saw kerf and metal flashing to weatherproof the joint as is done in the standard construction.

It will make little difference if you prefabricate the ranch house with its stepped-down wood-floor construction, with the basement alternate or with a warm-slab concrete floor. How the sections would be placed on a warm-slab foundation is shown in on page 126. With the basement alternate, a horizontal strip of siding is

used to cover the floor-joist frame below the wall sections.

Renting a small trailer will solve the problem of transporting the wall sections to your lot, or you can hire a truck to haul them all at once. When the roof is completed and your bench-built house is fully enclosed against wind and weather, you proceed with the plumbing, wiring and interior finishing as heretofore described in this book.

This prefabrication requires more cutting and fitting than when building the walls in large sections; but, if you have a little free time each evening and not too much to spend out at the site, you can build one wall section each evening—with no time lost traveling to the site. In cost, the prefabrication will probably add \$200 to the total cost of materials, but this will certainly be offset if the “bench build” is the one way you will have the time to build your home yourself. The choice is a matter of your personal situation—either way you will have a real home!

MATERIAL LIST

FOR THE FULL 81-FOOT RANCH HOUSE

CONCRETE

House and garage walls and footings
21 cu. yds. ready-mixed concrete, 1-3-5 mix
Garage and breezeway floors
6 cu. yds. ready-mixed concrete, 1-2-4 mix

FOUNDATIONS

5 lbs. concrete-drive nails or 45 $\frac{3}{8}$ x 12 in. bolts
18 lin. ft. 1 x 4 in. for vent boxes
7 lin. ft. 2 x 8 in. for entrance box

FLOOR BEAMS

20 lin. ft. 6 x 6 in. cedar far posts
186 lin. ft. 2 x 6 in. (in 12 or 16 ft. lengths) for beams

SILL

250 lin. ft. 2 x 4 in. for garage and house

FLOOR JOISTS

46—2 x 10 in x 16 ft.
12—2 x 10 in. x 14 ft.
29—2 x 10 in. x 12 ft.
8—2 x 10 in. x 8 ft.
100 lin. ft. 2 x 10 in. for joist-end blocking (for saving here, first use drop-off from joists)
20 lin. ft. 2 x 4 in. for ledger plates
5 two-joist metal hangers (or use ledger plates)

BRIDGING

230 lin. ft. 1 x 3 in. (or 2 x 2 in.) No. 2 common

SUBFLOOR

44—4 x 8 ft. panels unsanded $\frac{3}{8}$ in. plywood (plyscord)
(or 1800 bd. ft. shiplap)

SOLE AND TOP PLATES

1000 lin. ft. 2 x 4 in.
40 lin. ft. 2 x 6 in.

STUDDING

276—2 x 4 in. x 8 ft. studs
11—2 x 6 in. x 8 ft. studs
250 lin. ft. 2 x 4 in. for cripples, etc.

HEADERS AND ROUGH SILLS

2—2 x 12 in. x 18 ft. for garage door
2—2 x 10 in. x 16 ft. for living room
2—2 x 10 in. x 12 ft. for den
2—2 x 8 in. x 10 ft. for breezeway
2—2 x 6 in. x 6 ft. for vestibule
3—2 x 4 in. x 16 ft. for master bedroom
9—2 x 4 in. x 12 ft. for bedroom, dining room, and garage
166 lin. ft. 2 x 4 in. for doors, small windows and soffit headers

SHEATHING

34—4 x 8 panels unsanded 5/16 in. plywood (plyscord)

ROOF TRUSSES

84—2 x 6 in. x 14 ft. No. 2 common
84—2 x 4 in. x 16 ft. No. 2 common
126—1 x 6 in. x 10 ft. No. 2 common
6—4 x 8 ft. panels unsanded $\frac{3}{8}$ in. plywood (plyscord) (for saving, first use drop-off from subfloor)

CEILING JOISTS

9—2 x 8 in. x 16 ft.
12—2 x 6 in. x 16 ft.
2—2 x 6 in. x 14 ft.
16—2 x 6 in. x 12 ft.
2—2 x 6 in. x 10 ft.
60 lin. ft. 2 x 6 in. for bridging
30 lin. ft. 2 x 4 in. for vestibule joists
34 lin. ft. 2 x 2 in. for ledger plates

RAFTERS

5—2 x 6 in. x 22 ft. hip rafters	
13—2 x 6 in. x 16 ft. common and end rafters	
Jack Rafters	Valley Jacks
9—2 x 6 in. x 16 ft.	1—2 x 6 in. x 6 ft.
9—2 x 6 in. x 14 ft.	2—2 x 6 in. x 4 ft.
18—2 x 6 in. x 12 ft.	2—2 x 6 in. x 2 ft.
9—2 x 6 in. x 10 ft.	8—2 x 4 in. x 6 ft.
18—2 x 6 in. x 8 ft.	
9—2 x 6 in. x 6 ft.	20 lin. ft. 2 x 6 in. for
10—2 x 6 in. x 4 ft.	ridges, etc.
10—2 x 6 in. x 2 ft.	

SOFFIT FRAMING

664 lin. ft. 2 x 4 in.
244 lin. ft. 1 x 6 in. clear stock for fascia board

ROOF SHEATHING

2200 bd. ft. 1 x 6 in. sheathing (spaced 2½ in.)
244 lin. ft. metal eave flashing

ROOFING

33 squares No. 1 cedar shingles or equivalent in composition shingles

INSULATION

1200 sq. ft. ceiling insulation (2-in. blanket)
1100 sq. ft. wall insulation (1-in. blanket)

WINDOW FRAMES (clear stack)

<i>Louvered</i>	<i>Dining Rm. and Nook</i>
2—2 x 6 in x 16 ft.	2—2 x 6 in. x 12 ft.
2—2 x 6 in. x 12 ft.	3—2 x 6 x 10 ft.
4—2 x 6 in. x 8 ft.	2—2 x 6 in. x 4 ft.
15—2 x 6 in. x 7 ft.	<i>Kitchen and Utility</i>
11—2 x 6 in. x 4 ft.	8—2 x 6 in. x 4 ft.
<i>Clerestory</i>	<i>Garage</i>
2—2 x 6 in. x 14 ft.	2—2 x 6 in. x 12 ft.
4—2 x 6 in. x 12 ft.	4—2 x 6 in. x 4 ft.
<i>Bathroom</i>	
1—2 x 6 in. x 12 ft.	

WINDOW LOUVERS (clear stack)

56—1 x 6 in. x 4 ft.
22—1 x 4 in. x 4 ft.
36 lin. ft. 1 x 4 in.
3—4 x 8 ft. panels $\frac{3}{4}$ -in. plywood (vertical-grain fir preferred) for louver doors
15 lin. ft. 48 in. copper or aluminum screen.
130 lin. ft. rubber weather stripping
130 lin. ft. $\frac{1}{2}$ x $\frac{3}{4}$ in. screen mold

WINDOW GLAZING

(panes given below are cut to fit the completed frame)
7—3/16 in. crystal panes, approx. 48 x 62 in.
7—3/16 in. crystal panes, approx. 48 x 52 in.
1—3/16 in. crystal pane, approx. 42 x 52 in.
3—½-in. D.S. panes, approx. 40 x 43 in. (for garage)
1—fluted-glass pane of type desired, approx. 52 x 62 in. for nook partition wall

- 360 lin. ft. ½ x 1 in. wood stop
 (Panels given below are purchased in sash. Window frames are built to fit the sash.)
 7—28 x 42 in. (sash size) single pane casements in 2-inch wood sash for clerestory windows
 1—24 x 42 in. (sash size) single pane casements in 2-inch wood sash for bathroom
 2—40 x 38 x ¾ in. two-pane metal casements (both panes opening) for kitchen and utility room

EXTERIOR DOOR FRAMES (clear stock)

- 1—2 x 6 in. x 18 ft. far garage door
 6—2 x 6 in. x 14 ft.
 35 lin. ft. ½ x 2¼ in. door stop
 2—36 x 6 in. oak thresholds

NOOK PARTITION WALL (clear stock)

- 1—2 x 6 in. x 14 ft.
 1—2 x 6 in. x 12 ft.

SOFFIT FINISH

- 20—4 x 8 ft. panels ¾ in. exterior plywood (plyshield)

FINISH SIDING

- 38—4 x 8 ft. panels ¾ in. exterior plywood (plyshield) (cut to 16 in. widths, lapped 14 in. to weather)

BREEZEWAY

- 16—4 x 8 ft. panels ¾ in. exterior plywood (plyshield) for both walls and ceiling

GUTTERS

- 244 lin. ft. waad or metal gutter
 5—10 ft. lengths rectangular downspouts
 10—75 degree downspout elbows
 5 downspout outlets for type of gutter used—drain tile to suit lot

ISLAND-WALL FIREPLACE

- 1500 finish brick of type desired
 1500 rough brick
 100 fire brick
 1 tan Arizona fieldstone or similar
 5 lengths of 13 x 13 in. flue liner
 7 lengths of 8½ x 13 in. flue liner
 1 cleanout door
 1—36 in. fireplace damper
 1 pc.—¾ in. angle iron, 3½ x 3½ x 96 in.
 3 pcs.—¾ in. angle iron, 2 x 3 x 50 in.
 1—30 in. length 1½ in. brass tubing
 1—30 in. length 1 in. pipe

DOORS

- 1—3 ft. x 6 ft. 8 in. exterior front door
 1—3 ft. x 6 ft. 8 in. exterior flush rear door

- 2—2 ft. 6 in. x 6 ft. 8 in. exterior flush doors
 6—2 ft. 6 in. x 6 ft. 8 in. interior 1¾ in. flush doors
 2—2 ft. 10½ in. x 6 ft. 8½ in. accordion doors (standard size)
 1—16 x 7 ft. overhead garage door

CEILINGS

- 42—4 x 8 ft. panels ¾ in. plywood (plypanel)

WALL PANELING

- 3—4 x 8 ft. panels ¼ in. walnut plywood for living room
 3—4 x 8 ft. panels 5/16 in. plyscard far walnut underlay
 24—4 x 8 ft. panels ¾ in. plyweave, vertical-grain fir or other plywood for living room and den
 14—4 x 8 ft. panels ¾ in. plywood far bath and kitchen (vertical grain fir preferred for enameled walls)
 16—4 x 8 ft. panels ¾ in. plywood (plypanel) for utility room, Vestibule, closet and mud room
 (On any above ¾ in. paneling, ¼ in. plywood with 5/16 in. underlay can be substituted)
 16—4 x 8 ft. panels ¼ or ¾ in. plypanel for papered bedrooms
 48 sq. ft. tileboard far shower

INTERIOR TRIM

- 8—1 x 4 in. x 14 ft. for door frames
 2—1 x 4 in. x 12 ft. far door frames
 102 lin. ft. ½ x 1½ in. door stop
 600 lin. ft. 1¼ x 1¼ in. pine outside corner mold
 150 lin. ft. 4 in. baseboard (sanitary type)
 40 lin. ft. 4 or 6 in. baseboard far breezeway
 88 lin. ft. 4 in. rubber or asphalt baseboard for kitchen, utility, and bathroom
 3—8 ft. lengths Weldwood O.C. mold far living room

FLOORING

- 1175 sq. ft. of floor surface requires 16 cartons of 12 x 12 in. cork tile and
 38—4 x 8 ft. panels ¼ in. plypanel underlay

HEATING

- 1—18-15 or 18-20 oil furnace (General Electric) or equivalent gas furnace, with warm-air reverse plenum on rear and return plenum on right side
 6—Air-Wall baseboard register assemblies
 2—Air-Wall wall-type register assemblies
 1—6 x 10 in. wall register far kitchen
 2—6 x 12 in. return-air wall grills
 1—6 x 12 in. return-air floor grill
 1—3¾ x 24 in. oak grill stock

Warm Air Ducting

- 3—3 ft. lengths 10 in. round duct
 1—3 ft. length 9 in. round duct
 1—10 in. reducer with two 5 in. and two 4 in. outlets
 1—9 in. reducer with four 4 in. outlets
 1—10 in. plenum elbow
 1—9 in. plenum elbow
 26—3 ft. lengths 4 in. round duct
 18—3 ft. lengths 5 in. round duct

- 14—4 in. universal duct elbows
 2—5 in. universal duct elbows
 1—10 in. universal duct elbow
 2—5 x 4 in. duct reducers

Return Air Ducting

- 4—3 ft. lengths 7 in. round duct
 7—3 ft. lengths 12 in. round duct
 4—7 in. universal duct elbows
 3—12 in. universal duct elbows
 40 lin. ft. jaist duct tin

PLUMBING

Pipe and Fittings

- 10—5 ft. lengths 4 in. cast-iron soil pipe
 2—4 in. "Y" branches
 1—4 in. long-turn quarter bend
 1—4 in. long-turn quarter bend "Y"
 2—4 in. cleanout ferrules
 1—4 x 2 in. reducer
 1—4 x 2 in. sanitary "T"
 1—4 x 1½ in. tapped sanitary "T"
 1—4 x 4 in. sanitary "T"
 1—4 in. closet bend
 1—1½ x 2 in. calking sleeve
 1—5 ft. length 2 in. cast-iron soil pipe
 1—2 in. quarter bend
 1—4 in. roof flange
 1—1½" roof flange
 80 lbs. calking lead
 8 lbs. oakum
 4 lin. ft. 2 in. galv. pipe
 70 lin. ft. 1½ in. galv. pipe
 1—2 in. threaded sleeve for 2 in. soil pipe
 2—2 x 1½ in. long-turn waste tees
 2—1½ in. long-turn waste tees
 5—1½ in. hub-tap waste tees
 1—1½ in. sanitary waste tee
 2—2 in. 45 degree waste ells
 3—1½ in. 45 degree waste ells
 9—1½ in. galv. ells
 2—1½ in. galv. tees
 1—2 x 1½ in. galv. reducer
 1—1½ in. plug
 9—21 ft. lengths ¾ in. galv. pipe
 2—21 ft. lengths ½ in. galv. pipe
 4—¾ in. drain cacks
 3—¾ in. unions
 11—¾ in. galv. tees
 10—¾ in. galv. ells
 1—½ in. galv. tee
 9—½ in. galv. ells
 5—¾ in. galv. 45 degree ells
 2—¾ x ½ in. reducers
 2—hose faucets
 2—6 ft. lengths ½ in. chromed copper tube
 16—½ in. slip-joint nuts for tubing
- ##### Bathroom Fixtures
- 1—5 ft. recess tub with left-side drain
 1—1½ in. universal cast-iron P-trap for tub
 1—combination tub-shower faucet set

- 1—5 ft. sliding-door gloss tub enclosure (optional) (San Francisco Gloss Co.)
- 1—lavatory with faucets and drain trap
- 1—water closet
- 1—chrome recessed soap holder and grab bar
- 1—chrome recessed paper holder
- 2—chrome towel bars
- Kitchen Fixtures**
- 1—SE-100 electric sink with automatic dishwasher (General Electric)
- 2—1½ in. chromed P-traps for electric sink
- 1—DG-8 table-top 40-gal. water heater (G.E.)
- 1—ventilating fan (optional)

Utility Room Fixtures

- 1—single or 42 in. double laundry tub
- 1—drain trap for tub
- 1—set shelf-mount tub faucets

WIRING

- 1—No. 663-108 service entrance box (General Switch Corp.)
- 1—230 v. meter box and service connections to fit local code
- 38 ft. 3-wire No. 2 service entrance cable
- 18 ft. 3-wire No. 6 service cable for range
- 12 ft. 3-wire No. 10 non-metallic cable
- 15 ft. No. 6 white wire
- 2—250 ft. rolls 2-wire No. 12 non-metallic cable
- 2—250 ft. rolls 2-wire No. 14 non-metallic cable
- 1—1000 ft. roll No. 18 TF single wire
- 2—230 v. flush range receptacles
- 8—4 in. octagonal outlet boxes
- 4—bracket receptacle boxes with clamps, 3 in. deep
- 23—bracket receptacle boxes with clamps, 2½ in. deep
- 1—water-pipe ground clamp
- 5—pull-chain light fixtures
- 1—porcelain light fixture for garage
- 13—ceiling light fixtures of type desired, plus 4 in. outlet boxes, if required for fixtures chosen
- 1—standard 4 ft. fluorescent tube for bathroom

- 2—40 watt Lumiline tubes for island closet
- 1—115 v. Press Plate or standard toggle switch
- 26—duplex or triplex receptacles
- 1—single receptacle for bathroom cabinet
- 2—3 gang Touch-Plate No. 1400C low-voltage switches
- 5—2 gang Touch-Plate No. 1400B low-voltage switches
- 7—single Touch-Plate No. 1400A low-voltage switches
- 6—flush doorbell buttons (for l.v. switches)
- 1—low voltage relay box. Choice of No. 6 box with six assembled relays (for master panels) and six additional No. 1550A relays, or No. 1620 box, plus twelve No. 1550A relays, one No. 78K-1 transformer and one No. 17C converter. (Touch-Plate Mfg. Corp.)

CABINETS AND BUILT-INS

- 4—4 x 8 ft. panels ¾ in. oak plywood for kitchen cabinets
- 3—4 x 8 ft. panels ¾ in. plywood (of type matching living room walls) for island closet
- 18—4 x 8 ft. panels ¾ in. plywood (plypanel or better) for cabinets and wardrobes
- 14 lin. ft. 2 x 6 in. birch for both cabinet
- 8 lin. ft. 1 x 6 in. birch for both cabinet
- 6—3 ft. x 6 ft. 8 in. x 1½ in. flush doors for wardrobes
- 1—24 x 25 x 2½ in. maple chopping block
- 1—4 x 5 ft. No. 70 breakfast booth and No. 242 pedestal table (Plyline Mfg. Co. or Sears, Roebuck Co.)

HARDWARE

- 2—10 ft. lengths No. 604 double overhead track
- 12—nylon-wheel No. 601S hangers for double track
- 12—No. 1610 flush satin bronze door pulls
- 33—No. 1004 satin bronze ¾ in. inset hinges
- 36—No. 1031 coppered flush pin hinges
- 8—No. 1017 US26 chromed ¾ in. inset hinges for kitchen lower cabinets
- 5—No. 1333 chromed 4½ in. drawer pulls for kitchen
- 8—No. 1340 chromed 9 in. drawer pulls for kitchen
- 20—No. 1213-1301 coppered Spotlite knobs for kitchen and utility upper cabinets

- 22—No. 1212-1302 satin-bronze Spotlite knobs for louvers
- 1—Mod. CU-11 "Lozy Susan" unit
- 1—Mod. UB2BE four-drawer unit
- 4—Mod. U metal drawers (3 x 13½ in.)
- 1—Mod. 8 metal drawer (7½ x 13½ in.) (above available Washington Steel Products Co.)
- 1—front door Integrolock doorknob
- 3—tubular doorknobs with key locks
- 5—tubular doorknobs without locks
- 1—tubular doorknob with bathroom lock (all above doorknobs, Sargent or similar, with large roses and all locks keyed alike)
- 22—bullet catches
- 16 lin. ft. brass piano hinge for island closet
- 2 lin. ft. chrome piano hinge
- 26 magnetic cabinet latches (Leco-Latch)
- 3 pr. 4 x 4 in. butt hinges
- 8 pr. 3½ x 3½ in. butt hinges
- 2—friction latches for linen closet
- 1 set garage overhead door hardware
- 4—satin bronze casement latches
- 1—chrome casement latch for both window
- 1 pr. 10 in. Whitco-type casement hinge for both
- 2 pr. 12 in. Whitco-type casement hinges for clerestory windows

NAILS

- 2—100 lb. kegs 16d common or box
- 2—100 lb. kegs 8d common or box
- 50 lbs. shingle nails
- 50 lbs. galv. 6d casing (for siding)
- 10 lbs. galv. 8d casing
- 10 lbs. galv. 16d casing
- 40 lbs. galv. 6d box or borbed (for flooring)
- 30 lbs. 6d box
- 20 lb. 8d finish
- 40 lbs. 6d finish
- 40 lbs. 4d finish
- 25 lbs. (dry weight) waterproof glue

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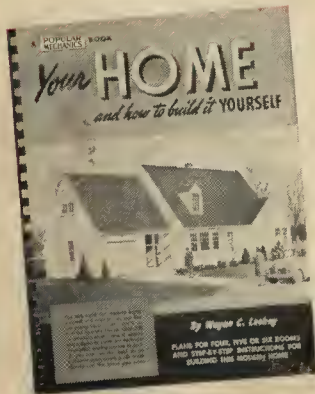
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